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User Open On Closed Shop

By Patrick Ward
Of the CW Staff

MANSFIELD, Ohio – A trend toward "white collar" unionization of technical and clerical workers has brought the union card and shop floor steward into data centers across the country.

From the DP manager's point of view, unionization has both positive and negative aspects, according to Don Jenkins, manager of operations and communications for the Tappan Co. Jenkins' 22-member staff of computer operators, control clerks and data entry operators has been represented by the Independent Stove Workers since the mid-1960s.

On the bright side, Jenkins said, unionization simplifies the DP manager's task of deciding what to pay which employee.

"It's controlled by grade levels, by contractual increases and by cost-of-living increases," he pointed out.

"I've been in other shops where you've got all these myriads of merit reviews to go through, and Silly's screaming because the girl next to her is making a dollar a week more. I don't have to put up with that," Jenkins explained.

The fixed pay rates also allow him to plot his personnel budget very accurately except in the years when salaries are being renegotiated, he added.

On the negative side, Jenkins said unionization definitely cuts down a manager's freedom of ac-

(Continued on Page 4)

As Condition of FCC Approval

DDS Users in 19 Cities to Pay More

By Ronald A. Frank
Of the CW Staff

WASHINGTON, D.C. The Federal Communications Commission's (FCC) "conditional approval" of AT&T's Dataphone Digital Service (DDS) in 24 cities [CW, Dec. 18] means customers in 19 of the 24 cities will have to pay as much as 50% more for the same service.

The FCC order said AT&T can offer DDS in five initial cities at the low rates filed by Bell. But DDS service in the 19 remaining cities must be offered at rates no lower than the existing higher private-line rates that currently apply under Tariff 260.

The low rates filed by AT&T in Tariff 267 will apply in Boston, New York, Philadelphia, Washington, D.C. and Chicago.

The first users will get service in about a week, an AT&T spokesman said.

The 19 additional DDS cities are Atlanta; Baltimore; Cleveland; Dallas; Denver; Detroit; Hartford, Conn.; Houston; Kansas City, Mo.; Los Angeles; Miami; Milwaukee; Minneapolis; New Haven, Conn.; Newark, N.J.; Pittsburgh, Pa.; Portland, Ore.; St. Louis and San Francisco.

Service in the first of these 19 cities could begin in about six months, the AT&T spokesman estimated.

Comparisons Difficult

Exact comparisons of the two-tier rates are difficult. Private-line high/low rates are charged according to routing mileage and other geographic factors while DDS is based on speed of transmission and mileage. But a comparison of DDS rates with private-line charges within the five-city area gives some indications.

Between New York and Washington, a 2,400 bit/sec link costs $262.40/mo while a high-density bill with Bell data sets would come to $405/mo for the 206-mile circuit.

Between New York and Chicago a 2,400 bit/sec link would cost $464.80/mo on DDS while the high-density rates with Bell data sets would be $835/mo for the 712-mile link.

These costs, compiled by AT&T, include DDS rates from Data Service Unit (DSU) to DSU on the DDS network.

Admittedly these comparisons are subject to many variations. With DDS the user in an outlying area must pay for a Type 11 Data Access Line (DAL) in addition to the intercity rates.

As an example, a customer operating between Waltham, Mass (12 miles from Boston) and New York will pay $130/mo for the Type 11 DAL plus $1.30/mile monthly. From Boston to New York the rate is $60/mo plus $.90/mile monthly for the 189-mile circuit.

On top of that the DSU costs $15. These charges would be for a 2,400 bit/sec link and other DDS speeds would be proportionately different.

In announcing its dual DDS pricing, the FCC said it would not allow the lower DDS rates in all 24 cities because "we do wish to learn more of the market demand for the DDS class of service . . ." At the same time the commission said it wanted "to make available to as many users as

(Continued on Page 2)

CW Photo by Ronald A. Frank

Barry T. Sullivan, a communications craftsman at the AT&T Long Lines center, uses a 950A DDS test board to check the all-digital link between the Boston hub office and Waltham, Mass.

UK Tests Show Some Minis Outperform Bigger CPUs

By Don Leavitt
Of the CW Staff

LONDON – Results of a benchmarking project run by the British government's Central Computer Agency (CCA) showed some minis with power equal to or in excess of some full-scale mainframes, although the general pattern was "predictable."

The "Whetstone" project encompassed a broad range of minis and mainframes, largely from U.S. vendors, rank ordering the computing power of each as seen by an objective systems staff.

A few of the more interesting direct comparison showed:

- An IBM 360/195 executed 8.9 times the number of test instruction/sec as the 360/65.
- An IBM 360/65 executed 8.7 times the number of instructions as the 360/50.
- Control Data Corp. (CDC) 7600 14.8 times the number executed by a CDC 6400.
- Data General Eclipse – 7 times the number executed by a Nova 840.

Composite Instructions

The benchmark itself was made up of modules of code that attempt to use the features of high-level languages – Fortran, in reported results – in approximately the same proportions the user would. Scores, however, were calculated on the number of composite machine level instructions, called "Whetstones," processed each second by the individual machine.

The program used in the test run consisted of 10 modules, each of which exercised a group of language features. Each module was placed in a loop and the number of times it was exercised was adjusted to mimic as closely as possible the available statistical profiles of language feature usage.

Features exercised in this way include simple variable and array addressing, fixed and floating-point arithmetic, sub-

(Continued on Page 2)

Compromise Privacy Bill Passed

By Nancy French
Of the CW Staff

WASHINGTON, D.C. – A compromise law to guarantee the privacy of individuals' personal records kept in government data banks passed both houses of the Congress last week and is expected to be signed by the President before Christmas.

The bill, which applies to all federal data systems, with the exception of law enforcement records and some military and Civil Service Commission records, requires agencies to observe the following rules:

Every data file must be listed annually by type and general contents in the Federal Register and also published in an annual data bank directory available to the public.

Citizens who wish to examine their records must be provided copies by mail within 10 days.

Citizens who wish to correct their records may do so by mail, and the agency must investigate the claim "promptly." In the case of a disputed record, an individual may insert his perception of the facts in his record.

Agencies must investigate the accuracy, completeness and timeliness of information any time the data is either used or disseminated to another agency except in cases where the inquiry has been made under the Freedom of Information Act.

Government agencies have nine months to issue internal rules and procedures for compliance.

Under a last minute decision, the Office of Management and Budget will be responsible for overseeing implementation.

The bill also provides for a privacy commission, with subpoena power but without enforcement power, whose function will be to study legislation for the private sector.

No agency or its employee may obtain through the commission any information to which others are not entitled. In addition, any commission member who obtains information because of his position is subject to a fine of $5,000.

CW Year-End Review and Forecast

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D.A.'s Office Claims

L.A. Check Thief Had DP 'Know-How'

By Patrick Ward
Of the CW Staff

LOS ANGELES — Whoever forged stolen, blank Los Angeles municipal treasury demand checks in an attempted $3.5 million fraud scheme [CW, Dec. 18] "almost certainly" had a DP background or was at least familiar with computer check printing, a spokesman for the Los Angeles district attorney has said.

But the City Data Services Bureau's (DSB) general manager, T. Tamaru, disagreed. Based on the forged checks he has seen, the forger may have had DP knowhow but not the "precise knowledge" to produce a flawless facsimile of a city treasury demand check, Tamaru stated.

"The way we see it, it was plain theft with forgery and fraud thrown in," he said. "That sort of thing has been going on for hundreds of years."

Interpol has reported that it traced funds from a fraudulent city check made out for $902,000, the only one of 17 stolen blanks that Los Angeles officials know to have been cashed.

The $902,000 check was first cashed at New York City's Crocker International Bank and the funds were then transferred to several European banks, finally reaching the Hollandische Bank Uni, N.B., The Netherlands.

On Dec. 2, 3 and 4, Interpol said, approximately $810,000 in cash was withdrawn from the Dutch bank in Danish, British, Dutch and American currencies.

Los Angeles officials contend the city won't have to pay the amount of the fraudulent check since city computers, lacking any authorization for its payment, rejected it within the legal time limits.

And the Dutch bank may not wind up with an $810,000 loss, either. A spokesman from the Los Angeles district attorney's office noted "there certainly will be suits filed because nobody wants to get stuck with that kind of tab."

James A. Doherty, assistant Los Angeles city attorney, said he did not expect the city will face negligence suits of any kind. The stolen banks were demands, or warrants, on the municipal treasury, he said, not forms for negotiable checks drawn on a bank.

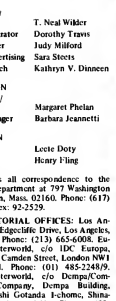
The city demand checks are transferable and endorsable only if a bank decides to accept them on face value without verifying whether they are legitimate, Doherty said, and this distinction leaves the city in a strong position to resist any negligence suits.

Meanwhile, investigators are quizzing DSB staff members and other city hall employees as they try to find how and from where the blank municipal treasury forms were stolen.

Possible sites for the theft include a locked and guarded storage cage in the DSB; the city controller's office, to which the checks are delivered; and the IBM factory in Campbell, Calif., where the check forms are printed. The checks also could have been stolen sometime during their delivery to the city.

"IBM has no reason to believe that the checks were stolen from [it]," an IBM spokesman said.

There have been no further arrests in the case.



CW Photo by Ronald A. Frank

Edward F. Loughlin, DDS operations supervisor in AT&T's Boston hub office, adjusts the transmission equipment that will be used for first customers between Boston and New York. The circuit has been undergoing data tests since October 1973 in preparation for the start of DDS service.

Some DDS Users to Pay Extra

(Continued from Page 1)

possible as promptly as possible the improved service quality expected from end-to-end digital transmission technology."

Much of the delay associated with AT&T's DDS proposal had related to claims from MCI, the Data Transmission Co. (Datran) and others that DDS was an unfair offering priced in a manner that would adversely affect other carriers. Addressing this issue, the FCC said it could not conclude that the DDS rates are predatory, anticompetitive or otherwise unlawful, but it added "that a substantial question exists as to the appropriateness of the proposed rates and their potential anticompetitive impact."

To resolve this issue the commission ordered an expedited hearing on the DDS rates. It said the hearings should reach a decision as soon as possible but, in any event, the higher private-line rates in the 19 cities for DDS would expire in 12 months, on Dec. 16, 1975.

AT&T was ordered to add provisions to its DDS tariff stating that the service would be all-digital in nature and that Bell companies must make DDS facilities available to other carriers for interconnection and estsblishing the minimum error rate and quality of service the customer is entitled to receive.

Before it can offer DDS service in any of the 19 cities, AT&T will have to file a new tariff that matches existing private-line rates, the FCC ordered. It is not known whether AT&T will use a flat fee or how it will price this interim rate.

Since DDS includes the cost of the DSU, it is assumed that AT&T will include a comparable end-to-end service with a Bell data set as a basis for its interim price schedule for the 19-city DDS service. Under the FCC order, AT&T must give notice 30 days before the interim rates go into effect.

The specialized carrier directly affected by the DDS service is Datran. The company is currently offering private-line services between Houston and Chicago. In addition, the first customers are testing its switched digital Datadial service along the same route (see related story on page 15). Although pricing schemes are different, Datran averages about 40% higher rates than DDS, according to one tariff expert.

During its DDS hearings, Datran told the FCC that DDS rates were predatory and would have an anticompetitive effect on other carriers. This is one of the points that the commission has said it will explore further in its new hearings.

Tests Show a Few Minis Outperform Larger CPUs

(Continued from Page 1)

routine calls and parameter passing, and standard mathematical functions. All the loops have been arranged so that an optimizing compiler cannot remove a significant amount of code from them, sources said.

Performance factors were calculated on the supposition that execution times of the individual modules should provide points on a straight line graph, plotting time against loop count. Dividing the change of time in seconds into 1,000 provide the number of thousands of "Whetstone" instructions/sec. Each "Whetstone" instruction, calculated this way, is equal to approximately two machine language instructions, CCA said.

Designed by the Programming Languages Branch, Technical Services Division of the CCA, the benchmark was described, and partial results reported, by the agency's H. Curnow and B.A. Wichmann at the Benchmark '74 conference held in Cambridge, England, earlier this year.

There appears, however, to be a freeze on information to supplement the material. Neither Curnow nor Wichmann have been available for comment.

Even the material available was prescreened. CCA ruled out release of results for the Hewlett Packard 3000 and Digital Equipment's PDP-11/45. Scores for ICL equipment were also omitted, although backup material suggested performance comparable to that of the IBM 360/65, Data General Eclipse or Decsystem-10.

System	Single Precision	Double Precision
	(Thousands of Whetstone Instruction/Sec)	
CDC 7600	8333	—
IBM 360/195	5000	4760
CDC 6400	563	—
IBM 360/65	521	421
Eclipse	500	400
DEC KI-10	500	250
Sigma 9	483	361
IBM 370/155	465	—
Univac 1106	415	—
H635	357	312
Sigma 5	298	225
HP 3000	—	—
PDP-11/45	—	—
HP 21005	76	47
Nova 840	71	56
IBM 360/50	60	50

CCA's Raw Computing Index suggests that CPUs — minis and mainframes — fall into three general levels of "power."

Computer Aids in Recovery Of Stolen Lottery Tickets

HARTFORD, Conn. — A state employee who cashed state lottery tickets from unsold ticket books was discovered by the gaming commission's computer system.

The young man was employed by the State Comptroller's office transporting unsold lottery tickets to a mill for destruction.

The two winning $20 tickets that he cashed were identified by the computer as being unsold, and the resulting police investigation led to the youth's loss of both his "winnings" and his job.

PHASE 5 OF SYSTEM LIFE: ENHANCEMENT

Enhancing a production program will never be simple. But it can cost a lot less.

First your analysts and programmers have to think their way back into the system flow and the code.

Next they have to determine all the data structures, and find every data and statement label reference affected by the enhancement.

Last — though hardly least — they have to build a set of test data and repeat the verification procedure.

Even a simple Enhancement — adding a new reporting function to an accounting program, for example — should go through a cycle like that.

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First, you can produce program logic and detail flow charts automatically, from the existing source code, using the Module Analysis Processor (MAP) facility of AUTOFLOW II. The level of detail in the charts can be controlled by suppressing, for example, all procedures except decision points and I/O. MAP will also locate every data and label reference in the source code, pinpointing every line of code affected by a program change. Equally useful is the Critical Variable Analysis (CVA), which identifies every data field involved in every decision point in a program — a powerful aid in tracing flow.

In a group of programs, AUTOFLOW II's Cross-Program Auditor (CPA) isolates references to data fields across program boundaries, so that the impact of any change on the total system is instantly known.

Some Enhancements boil down to standardizing the source code to improve maintainability, optimizing to enhance program throughput, or modifying *en masse* often-used program logic to add new management information. MetaCOBOL is ready to help. For example, to add input/output record accounting logic in all COBOL programs, thousands of lines of code must be added to hundreds of programs. Using the MetaCOBOL Translator, define a few rules, translate all programs, and the job is finished.

The Translator comes with a comprehensive, flexible set of macros for a variety of standard applications, such as calls to IBM's IMS. But the beauty of the system is the fact that you can create your own macros to meet unique situations — and to enforce local programming standards.

The MetaCOBOL Test Data Generator (TDG) responds to a set of functional directives embedded in the source code to generate ideal test data, exercising every path of a program. A companion module, the Run-Time Debugging Aid (RDA), reports on the internal status of the system and the intermediate values of variables in any desired degree of detail. It too responds to embedded directives.

Still more help is available. The System Analysis Machine (SAM) produces an accurate forecast of the impact of the Enhancement on system throughput. You describe your IBM hardware and system software with a few macro calls, and let SAM's Automatic Model Generator use the output of a hardware monitor or IBM's SMF to model your existing workload automatically. This synthetic job stream model is augmented by a SAM representation of the Enhancement — and the total system is run and reported on.

During Enhancement, protect the integrity of the existing application with the access-control and auditing facilities of The LIBRARIAN. It keeps a history of all changes to a program and provides full administrative control of such changes. The LIBRARIAN lets you make trial changes to source code without affecting production versions of the program.

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Ware Advises

Subtle Economizing Could Cut Cost of Privacy Laws

By Nancy French
Of the CW Staff

WASHINGTON, D.C. – While little hard information is available on the cost of implementing privacy legislation, Willis Ware of the Rand Corp. predicted the right of privacy will cost taxpayers $50 million annually for two years for capital investment and $200 million annually for five years for operations.

Citing the Office of Management and Budget as the source of his figures, Ware said, however, that effective privacy safeguards can be instituted at a lower cost per system than one might expect.

A speaker at a seminar on privacy sponsored here by the Domestic Council Committee on the Right of Privacy and the Council of State Governments, Ware told state and local government conferees that "costs of security systems vary widely, and the language in your bill can greatly affect the cost of security needed to provide the amount of privacy your bill requires.

"Security can include protecting a system's physical hardware, personnel and information against deliberate or accidental damage," he said.

"It also involves protecting the system against denial of use by its rightful owners and protects information from falling into unauthorized hands," he explained.

Areas of Sensitivity

"In drafting legislation be sensitive to access, dissemination of corrections and purging," he warned.

To control access, "you need audit trails," he explained. But "think seriously whether you really need to record every single access or only special cases. The fewer you record, the less storage you need and the cheaper the system will be."

As for dissemination of corrections made by data subjects, Ware suggested distributing corrections to future data recipients would be far less costly than notifying data recipients on a retroactive basis.

Purging was another consideration Ware thought was worthy of study. "Ask yourself what you mean by purging. Does it mean actually destroying the data as soon as a purge notice is received, or does it mean to simply cease disseminating the information and destroy it at some convenient time in the future? The latter is clearly the less expensive way to go."

Costs of a privacy law that would not vary with legislative language include the provision for public notice of the existence of a system, training employees and developing procedures to implement new privacy standards, Ware said.

While these costs are significant, they are essentially "one-time costs and would not be materially affected by a bill's language," he pointed out.

In another piece of spending advice, Ware suggested careful review of funding requests for new security systems. "Ask for a total breakdown of costs," he urged.

"As agencies begin to implement privacy legislation, there will be a strong tendency to estimate costs on the high side and to plan a high contingency budget," he explained.

In addition, DP center managers are likely "to tack on a lot of other things they haven't gotten around to getting – things that have nothing to do with privacy," Ware said.

While the costs of privacy are high, the absence of privacy may also cost money by reducing the incentive to save through consolidation.

Noting that "data not collected can't be sensitive and doesn't need protecting," Ware told attendees to make an effort to "limit agencies to collecting as little as possible."

Finally, Ware said legislators should "insist on some type of assessment scheme within two years to determine what the system is actually costing."

'Datatalk' Converts Nonbelievers

Phone Service Introduces University to DP Power

By Vic Farmer
Of the CW Staff

TORONTO – In an effort to get more people interested in its computer facilities and services, the University of Toronto has initiated a new service, called Datatalk, for the university community.

To receive information from Datatalk, the end user simply phones the computer center and reads his problem to a programmer/system analyst sitting at a computer terminal.

As soon as the user phones in, the terminal operator goes on-line, and the operator's facility with both the applications library available and the university's APL-Plus programming language serves as a transparent interface directly to the university's IBM 360/65.

But the center's goal with Datatalk is not just to perform a telephone computer service. The center hopes Datatalk will serve as a missionary force that will demonstrate to its users the effective use of computing power in solving problems in all areas, according to Ernst Goetze, one of the service's operators and a graduate math student.

The callers need not understand APL, but, through interaction with Datatalk operators, a method of solving the problem as well as interaction with the computer is achieved, he added.

Lengthy, complex calculations or projects involving voluminous I/O are unsuitable for the telephone approach. However, a large number of applications are ideal, particularly the class of problem which is more than a little tedious to handle on a desk or pocket calculator, but too "trivial" to warrant the usual computer approach, Goetze said.

There are 50 users of the free service, and one of its guidelines is only to handle problems that take less than an hour to program. Most problems are handled in much less time, Goetze said.

The service also recommends alternatives when the problems cannot be handled readily. These alternatives include references to local campus programming groups and to other services available through the center such as batch processing.

Some of the routine chores handled by the service are computing averages, percentage breakdowns, financial calculations, cross-footed tabulations, as well as more traditional scientific and mathematical calculations in least squares curve fitting and statistics.

Datatalk uses Computer Devices, Inc. Teleterm 1030 terminals to supply a hard copy of the calculations, which are mailed to the users so they can verify accuracy.

The center's APL-Plus is a locally modified version of the I.P. Sharp service bureau implementation of extension to IBM's APL/360.

In an endorsement of APL, the service's operators said the syntax requirements of APL are minimal, data declarations are seldom required, and the APL primitives represent a synthesis of all the classical algorithms essential to a programmer . . . "and are therefore much akin to thought itself."

Started last May, the operators find users "learn intuitively to segment their computational requirements into logical blocks that can be handled relatively easily by primitives or functions available."

Datatalk over the past six months has grown slowly, but the organizers attribute slow growth only to lack of information on what the service can do. Presently a campaign is in process to explain the service to department heads in the university and the service anticipates greater response in the 36,000-person university user community.

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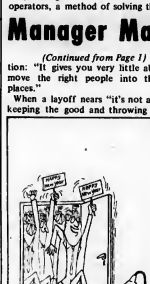
Manager Maintains Open Mind On Closed Shop

(Continued from Page 1)

tion: "It gives you very little ability to move the right people into the right places."

When a layoff nears "it's not a case of keeping the good and throwing out the bad," since the thing that counts is the worker's seniority, he said.



When a manager comes into a unionized shop from outside, as Jenkins did, he is likely to find some good staff members and "a lot of losers, and guess who has the high seniority dates?" he remarked.

Jenkins said the time a manager spends dealing with shop stewards probably depends on the rapport the manager has with his staff. He said he had no problem himself but knew of other supervisors who do lose a lot of time "going back and forth to the union stewards" because of employee complaints.

The manager of operations said that he personally had not run across a situation where the union prevented him from dismissing someone he felt he had to fire. It is usually "pretty easy to put together the facts and figures" demonstrated to the union steward that these people lost the company money through reruns or other causes, he said.

But "bumpable" jobs are a problem. These are typically lower level jobs for which management and union agree anyone can be trained, whether they have a related background or not.

"I no sooner get them trained and they become productive than bang!" a more senior person laid off elsewhere in the company comes in to take their place, Jenkins said.

DPers Get Vote

NEW YORK – Programmers, junior programmers, system test coordinators and schedulers can vote with Dean Witter & Co. office and clerical workers on whether they want to join Local 153 of the Office and Professional Employees International Union, but the DPers' vote will be subject to challenge, the National Labor Relations (NLRB) recently decided.

The NLRB stated it had found insufficient evidence that the brokerage house's DP staff would be appropriate members of an office and clerical union. However, in the interest of scheduling an early election, the board allowed the DP staff to vote under challenge.

If the DP staff's vote is crucial in determining the election's outcome, "then additional testimony will be taken to see if these employees belong in that bargaining unit," an NLRB spokesman explained.

A group of traders and assistant traders will also vote under challenge, the NLRB spokesman noted.

Minn. Privacy Law Meeting Resistance

WASHINGTON, D.C. – Despite the praise garnered by Minnesota last spring when it became the first state to pass a privacy law, state officials charged with implementing the act have not made much progress to date.

In effect since Aug. 1 [CW, May 8], the Minnesota privacy law, which covers all state and local government computer systems, is moving "very slowly," according to Dan Magraw, assistant director of the state's Department of Administration.

In an interview here last week, Magraw talked about some of the problems being encountered by the department, which is responsible for implementing the bill.

As an example of the type of cooperation officials have received from the state's 3,600 governmental units, Magraw said only 60% have responded to a letter informing them the law was passed and requesting that each provide the name of a contact with whom the Department of Administration could work.

Even the enclosure of a copy of the bill, which included sanctions for noncompliance, and a follow-up letter had little effect, Magraw said.

"It's a huge educational and communications project," Magraw said, and "it's symptomatic of the same old problem – local government resistance to state authority."

However, communications problems haven't slowed progress in other areas, according to Magraw. State officials hope to complete some general comprehensive regulations to set up procedures for carrying out the law by March.

To ease the burden of a large volume of inquiries from public officials, their lawyers and the public at large, an information center was established. Since the law provided a "bill of rights" allowing individuals access to their files, the center has been extremely helpful.

Next, to help develop the easiest method possible for local jurisdictions to furnish information about the nature and content of their personal information systems, the state surveyed data systems in four counties.

The limited survey has already revealed some very interesting information about the systems polled, Magraw added.

CW Photo by N. French

Dan Magraw

"Aside from a couple of accounting and fixed assets files, almost every single city and county file is some kind of people file," he explained. "About 75% of these are classified as public records while the other 25% are considered confidential.

"There is even less standardization of files and record forms than we thought," he said, "and the same records are often classified in different ways from county to county.

"For example, in one county salaries of public officials are kept private while in another that information is in open files and even published in the newspaper once or twice a year," he said.

In addition, many files set up for the same purpose contain widely differing amounts and types of information, Magraw said.

Officials in the state's largest school district decided that since the privacy law applied only to "permanent" as compared with "semipermanent" files, and their files were maintained for fewer than 365 days, they were not covered by the law, Magraw said.

Even more sobering has been the realization that in each phase of this activity "we were pitting privacy against the public's right to know," he said.

"One city manager told us 'almost every file we have is public information now. I can't make these files private.'" In that city, only criminal justice files were not made public information.

Compounding Minnesota's problems has been the omission of special funds to cover the administrative costs of implementing the bill. While some money was made available from other budgets, it appears now the law's implementors will need a separate appropriation to complete their work.

Privacy Seminar Attendees Agree

Public's Right to Know Poses Legal Dilemma

By Nancy French
Of the CW Staff

WASHINGTON, D.C. – The conflict between personal privacy in computer-based data banks on the one hand and the public's right to know on the other may prove to be the most difficult problem legislators will have to resolve in making new privacy laws work, federal and state officials agreed after two days of talks here last week.

The privacy seminar, sponsored by the Domestic Council Committee on the Right of Privacy and the Council of State Governments to discuss a coordinated federal/state strategy for passing and implementing privacy legislation, turned up several other key considerations upon which the success or failure of a bill would depend.

State assemblymen whose bills failed this year emphasized that any attempt to include the private sector virtually guaranteed failure. Examples of this error occurred in Michigan, Ohio and California, respective assemblymen said.

Another assured failure would result from attempting to include law enforcement files in a general bill, conferees heard.

Still another hot issue concerned legislative "approach."

"Shouldn't we concentrate more on limiting the collection of data rather than protecting the data we're so busy collecting?" some conferees asked.

The seminar attracted more than 100 legislators and state legislators and state executive department officials eager to learn from others' mistakes. The bulk of the two-day session was spent in mock legislative committee session where participants discussed the pros and cons of the various model legislation developed to date in an effort to draw up still another bill.

Meanwhile, still another committee, headed by Lee M. Thomas, executive director of the Office of Criminal Justice in the state of South Carolina, developed recommendations for an implementation strategy for cooperative federal/state/local privacy programs.

First among the recommendations was a statement of the principle that an implementation strategy could actually work.

"Although this cooperative effort would require deviation from many federal/state/local interactions of the past, the necessity of this cooperative effort is overwhelming," the committee said.

The second recommendation acknowledged the need for a single body at the federal level to act as a coordinating entity for federal privacy programs.

The third recommendation was aimed at coordinating efforts among the various state interest groups "to assure the privacy issue is addressed in a comprehensive fashion."

Fourth, the group voted to help the less experienced states catch up by providing technical assistance.

"The dissemination of federal legislation, rules and regulations, the source of technical assistance, model state privacy statutes and an accurate assessment of previous state and local privacy efforts is vital information that must be available in order for state and local units of government to act efficiently and effectively," conferees agreed.

A proposal that each state's governor call, within a year, a state conference on privacy involving the executive, judicial and legislative branches comprised the next recommendation.

The sixth recommendation encouraged the private business community to participate in the development of privacy programs since "the relationship between private and public information needs is such that they can't be treated completely separate."

Computers Not Unique Domain Of Information Abuse: Westin

WASHINGTON, D.C. – Computers are not uniquely responsible for abuses of the right of privacy; computers simply exacerbated abuses developed in systems where data was kept on file by cards, according to Dr. Alan Westin, well-known privacy author and professor of public law and government at Columbia University.

"The privacy abuses we are experiencing now would have gone on with or without the development of computers," he explained.

Speaking to a group of state and local officials at a conference sponsored by the Council of State Governments and the Domestic Council Committee on the Right of Privacy, Westin hailed the passage of a privacy law. But simply passing legislation will not make the privacy problem go away, Westin predicted. In fact, it will raise a lot of new issues.

"When you question what information an agency of the government collects, you call into question what activities that organization is actually involved in," he explained.

Questions that affect how a government agency assures eligibility for financial assistance, or questions about the Social Security system, for example, "are questions that go to the heart of our quality of life and the nature of our civilization."

Contrasting events in the U.S. with development of the privacy issue in Great Britain, Sweden and Germany, Westin explained the means we use to safeguard privacy must reflect the style of our citizens.

"The British teacup in the outbasket approach depends on their tradition of honor and good will to assure fairness in information practices. That may be all right for them, but it wouldn't instill much confidence in the U.S. citizen," he pointed out.

"On the other hand, the approach being taken in Sweden and Germany where centrally controlled data inspection boards are being established to license all data banks in both the public and the private sectors would probably not work for us either.

"Picture one of these in the U.S. in 1972, with John Dean as its chairman," Westin quipped.

Westin said studies have shown that "the patterns of data sharing did not grow at an alarming rate over the years, as predicted, but remained pretty much the same."

"At a time when the definition of privacy and what 'due process' actually consists of was changing, computers came along to make recordkeeping more efficient," he explained.

It was the publication of the Department of Health, Education and Welfare (Hew) report in 1973 that "gave us for the first time a way to get a handle on the problem" with the principle that at every level of government a concept of fair information practices should exist.

Editorial

A Time for Reflection

The holiday season should be more than just a time for good cheer and fellowship, although that is certainly important and a welcome break from our sometimes harried lives.

This time of the year also provides a good opportunity for thoughtful reflection, summing up and planning for the future, perhaps resolving to make it better and more productive than the past.

In DP this summing up is on two levels. First come the issues of national import and impact – data banks, privacy, the affect of automated systems on the national work force and the possible results of the antitrust suits against IBM and AT&T.

Secondly are the more local – some might say parochial – issues, such as increasing the efficiency of DP installations, meeting users' needs more effectively and insuring that DP serves the using organization as well as it can.

So along with the good fellowship and friendship of this time of year, all in DP should use this time to reflect on their work, their lives and their responsibilities.

'I Think I Got 'Em to Recognize the Privacy Problem– Mebbe You Can Get 'Em to Solve It...'

Letters to the Editor

Certification by Law Draws Fire

SCDP's Certification Law Contains 'Glaring Faults'

Your front page article on the model law drafted by the Society of Certified Data Processors (SCDP) to regulate the DP profession [CW, Dec. 11] depicts a plan with basic and glaring faults.

The article demonstrates a confusion between "computer professionals" and persons who practice data processing. The latter group is only a subset and cannot arrogate the broader title to itself.

Although it is doubtful that the content of undergraduate education is relevant to the practice of other learned professions, this proposed legislation creates a "learned profession" of four-year undergraduate specialists without establishing or recognizing an autonomous organization of peers, such as a bar or medical association.

This proposal for regulation displays a preference for persons who have undergraduate preparation in data processing. On the basis of the qualifications as published, there is reason to suppose that a second bachelor's degree, in data processing, rather than a master's degree in computer science, is the preferred way to spend a fifth year of study and gain the academic credentials demanded.

The article creates severe doubts as to whether the legislation described can serve as a model. It makes me hope that the interest expressed by certain organizations was only polite interest.

David Ames
Watertown, Mass.

Taking Exception

I agree with the SCDP proposal on state-level certification of computer professionals with one exception.

The proposed legislation appears to omit the holder of a two-year degree. At Texas State Technical Institute, the computer science technology degree requires 108 quarter hours (72 semester hours), of which 72 quarter hours (48 semester hours) are in computer programming. With regard to computer programming course work, this graduation requirement exceeds the major course work requirements for bachelor degree programs in the state of Texas.

In light of the above, it appears that a fourth path to certification should exist. This could require graduation from an approved two-year school or college and four or more years of active practice in DP work. The extra year of active practice is surely equal to two years of general education course work.

Ron Carswell
Program Chairman
Computer Science Technology
Texas State Technical Institute
Waco, Texas

A Bug in the Ointment

From the grimy northeastern horizon comes an odor, not unlike that of rotting fish, but more akin to the acrid smell of self-righteous bureaucratic nonentities. When all the talk about data processor certification began, I thought I detected a bug in the ointment but I couldn't quite place my finger on it.

Now the smoke is clearing and the dividing line appears much clearer. Isn't it rather amazing how the possession of a scrap of paper can elevate the self-esteem of the holder to the point that he insists that everyone else possess the same scrap or else spend $100 to $300 or three months in jail or possibly, and probably, both?

I wonder why the "DP professionals" picked Massachusetts to introduce certification legislation? It would probably seem more appropriate to the rest of the country, as onlookers, to choose Arkansas for such a giant step backward. I am surprised George Meany wasn't contacted to push this idea (but then again, maybe he has been).

As we look around each day of our lives and see the utter ineptitude and inefficiency of our governments, large and small, how can we even be asked to consider the idea of certification legislation enforced by those same bumbling incompetents?

We are deluged with editorials and articles bemoaning the reality of bad DP management and incompetents in our ranks and are told that legal and binding certification is the only way to "police" our profession. I, for one, already have here in Arkansas enough bullshit in my backyard with the "DP professionals" adding more to the pile.

If everyone is so overwhelmed with a concern for "policing" our industry, why don't we start at the root of the problem by deciding to improve ourselves by ourselves. Read more, think more, reflect more. Examine our own morals and values for relationships to hard reality – something most of us haven't done since puberty, and some of us never have done. Develop our own personal set of ethics based on what we value ourselves, not on what someone expects of us.

Despite the fact that to a computer everything is either yes or no, on or off, the "DP professionals" cannot help their profession one bit by attempting to apply the same rigid logic to others in the industry. The decision to hire or fire is a subjective one, not subject to the hard logic of a program cycle but rather to the personal morals and values of the person doing the hiring or firing.

Finally, put yourself in the humble position of appearing before a government board of your peers (a contradiction in terms from the start) to determine your competence in your field of knowledge. Give yourself long hair, a beard or whatever denotes nonconformity during that particular historic period and then rapidly compute your chances of qualifying on your merits of knowledge alone, which is really all that counts in the long run.

I look forward to that day, although a bit sadistically, because for me that will be the day I spit in their faces and tell them to take their laws (whims), their certificates, their industry and the antitrust department and go straight to hell.

That will also be the day I move to another line of work with a little less "professionalism."

F. Wilson Jones Jr.
Searcy, Ark.

Nothing in Return

Right on, Society of Certified Data Processors. You have not offered DP professionals anything of value in return for certification and therefore have not convinced significant numbers to bother with voluntary certification.

You are going to get "Big Brother" to imprison anyone who dares defy you by freely contracting with others for computer work without being "attested to and certified" and "of character deemed suitable" by you.

No thinking person should swallow your nonsense about state boards of registration and "proficiency" exams doing anything to "weed out some of the charlatans." Bar exams and state licenses did not prevent members of the bar from commandeering the White House recently.

Furthermore, I have not heard any victimized users screaming for the need to license data processors. Your organization seems to be the only one afraid of all those crooked data processors. Perhaps you know something about yourselves that users do not.

Paul D. Rolig
Orange, Calif.

Choice of the Individual

While reading the article on the SCDP's proposed legislation to regulate DP, it occurred to me that it is a bit high in its certification requirements and in its restrictions on allowing only Certified Data Processor (CDP) holders to "authorize" or approve all systems running on a computer.

This proposal would severely affect the smaller installations that cannot afford to pay the salaries demanded by CDP holders. I work in the insurance industry and we are not required to have a CPCU or CLU approve our insurance operations, and one does not have to be a CPA to keep a set of accounting records.

Granted, some type of state certification board for data processors would add to the credibility and professionalism of DP, but mandatory certification for every programmer, analyst and manager is too much.

Certification should be up to the individual. As such programs are instituted by states, only the highly capable individuals would achieve certification and rise to fill the responsible positions in data processing.

I feel my position is justified and is not too critical of the SCDP.

David Cole
San Antonio, Texas

(Other letters and commentaries on Pages 7, 8, 9 and 10.)

Letters to the Editor

Hospital System Diagnostics Clarified

In reference to the article "Hospital System Diagnoses 'Healthy' Outpatients' Ills" [CW, Nov. 6], several aspects of automated multiphasic health testing, mentioned in the article, are clarified below as practiced in the Baltimore Puhlic Health Service Hospital:

- Physicians receive the entire data base and not just abnormal findings since many "normals" are as revealing in the diagnostic process as abnormals.
- Nonacute, out-of-range values are posted hy the technician on a face sheet for the physician to evaluate prior to examination of the patient.
- If an emergent abnormality appears as the data are processed, the complete test is noted hy the computer system and the attending physician is immediately notified by the computer operator.
- Data base is useful for evaluating the patient over time, allowing, for example, a quick scan of laboratory tests over an extended period of time to detect changes. Thus, the "normals" for each patient will he determined on the basis of that individual's previous state.

Richard K.C. Hsieh
Chief, Health Services Research
U.S. Public Health
Service Hospital
Baltimore, Md.

NBS Not the NSF

The Nov. 20 issue has a front page article, "Standards Efforts, User Needs at Odds," which refers to me as representing the National Science Foundation.

I am employed by the National Bureau of Standards (NBS), and my affiliation was made clear in the ACM conference program.

The article, in identifying approaches to developing common system command languages, goes on to state that I "indicated a combination of these approaches would prohably create the best chance for maximizing standards while meeting user needs." Why would anyone want to do that?

I did, however, point out that the combined approaches of command language standardization, front-end translation of common protocols and access machines for protocols unique to individual users would be most effective in providing user assistance.

Robert P. Blanc
Washington, D.C.

Blanc's affiliation was inadvertently confused. We regret the error. Ed.

A Crumpled Year

We started hy trading cars out in the suhurbs, so someone could wait in line for hours for a few cups of gasoline. Then Watergate hegan to escalate. And the Europeans unraveled. And we switched to Jerry Ford, the Herbert Hoover of the Seventies. A messy, crumpled year!

In our own area, in the maze of data processing, things were not quite so bad: putting aside the spectacular rise in paper costs (another obvious ripoff: the sugar in our private supermarkets), we did continue to get slightly more bang for each of a very large number of hucks. This was largely due to the pressure from the mini people, makers and users; the accumulated inefficiencies of midrange systems, at the end of the six-year hardware cycle and the 12-year software cycle, made encouraging inroads possible.

The new fashionable idiocy, structured programming, turned out not to be all that idiotic after all, just a renaming of the obvious. Aside from seminar producers, nobody made much of a killing from it – unlike the Virtual Boom, which is still selling add-on core worldwide. For a very short but refreshing and elegant perspective on the problem of talking about structured programming, I recommend Peter Denning in the Novemher Sigplan (ACM Special Interest Group on Programming Languages) "Notices."

On the human side, privacy reigned supreme – in Sweden, in our own legislatures, in the trade and popular press. And that was good for all of us, as ordinary citizens and as supposedly responsihle professionals. This rather specialized concern did somewhat disguise other social/computer issues like responsiveness to complaints and, on a broader front, the Club of Rome sort of thing.

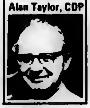
There is also a narrower human concern: guild matters. The focus this year clearly was on the Data Processing Management Association. On the one hand, they had serious prohlems of finances and management; on the other hand, they joined the Federation, to the great benefit of all parties.

There wasn't really much of a pattern. The dominant force, among our suppliers and in American society as a whole, continues to be unalloyed greed – but that doesn't change from year to year. I guess we have to wait – survive, might be a hetter term – until the 1976 announcements for a real supergraphic, major colorful stripe of change across the confusing wallpaper of the mid-Seventies.

Herb Grosch

CLA Opens DOS Support Service to All 360 Owners

The Taylor Report
By Alan Taylor, CDP



The Computer Lessors Association (CLA), which earlier this year started an experimental three-month support service for DOS users of IBM 360s leased from its members, has decided to open up the service to any user who owns a 360.

It has also decided to keep the service functioning into the indefinite future, according to Mike Creedon, CLA president.

The service has been well used, handling some 300 to 350 calls a month from its Richmond, Va., headquarters. Advice is given by telephone, with backup given by the technical staff attached to the individual leasing company when necessary. It is supported by newsletters which are distributed to installations using leased equipment.

The attraction of the service is quite simple, since IBM now asks for time and materials to support the software which can result in high costs without a guarantee of results.

The opening up of the service to independent users was partially the outcome of requests made by "Taylor Report" readers when they filled out a questionnaire on DOS support [CW, April 3]. When the results of the questionnaire were reported to the CLA board, Jim Benton, CLA executive director, said the decision to open up was unanimous.

Unanimous, that is, in principle. Details have still to be worked out.

Asking More Help

And that is where you readers are heing asked to help again.

Currently the association is considering three plans to determine how to charge for the service. The difference between the plans is the amount of the charge made per call. This can be high, as in Plan C or kept low, as in Plan A. (See box for details). Benton wants to know which plan you feel should be adopted.

In any case, the service is intended to include the provision of newsletters and any other benefits that are given to CLA users, except that independent users will be expected to pay their own phone charges. (Phone charges for CLA users are swallowed hy the association).

I do see some difficulties in the concept. Or perhaps some opportunities, which normally seem to grow from difficulty. For instance, the cost per call figure of $20 to $40 is very reasonable for users who would need to call only once a week. It is inadequate, however, for the handholding needed during the planning or implementation of some new function, such as moving into communications.

I can easily see four calls a week or even more being made as new applications are installed. And I don't think that this volume of calls should be discouraged by a charge of $20 to $40 per call, on top of a subscription service.

As I see it, the whole function of the CLA DOS support is to encourage the development of new applications by users. These applications don't need to be absolutely new – they only need to be new to the particular installation.

These new applications can increase the productivity of computers like 360s with ever-growing libraries. But such developments necessarily entail helping new users to hurdle initial problems as painlessly as possible.

And so I would like to see some modification of all the CLA plans to allow for short, concentrated periods of use for development and installation.

My second comment on the plan is that while newsletters are all very well, physical meetings are also needed, particularly for users developing systems.

Newcomers to the cluh need to meet old-timers. Old-timers need to exchange notes on sophistications that are beyond the scope of newsletters.

The suppliers of the service need to meet the users who are not calling in order to hear what help they need. And this all takes place much better by getting together in meetings.

But the CLA's DOS group has never met and has no plans to do so at this time.

But it is not what I want that the CLA is interested in. I haven't got a 360 in my basement (although, with the current prices, it might not be a bad idea!).

What the CLA-DOS people are interested in is your ideas, opinions and weighing of the pros and cons.

So, in the traditional manner, here is a questionnaire on your opinions which will be sent to the CLA to help with its planning. I'll keep you informed about the results. And thank you for speaking up in the past.

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Plan	Annual Subscription	Free Calls	Charge Per Call
A	$1,200	5 per week noncumulative	$20 after free calls
B	$600	None	$30
C	$400	None	$40

These three pricing plans for users of its DOS support service are currently being considered by the CLA.

How Should the DOS Service Be Priced?

(1) Which of the plans proposed by the CLA for its DOS support program do you prefer?

☐ Plan A ☐ Plan B ☐ Plan C

Why? ____________________

(2) Do you think that people using the service more – such as for new installations – should be charged lower rates per call?

☐ ☐

Why? ____________________

(3) Do you think that meetings for users of CLA's DOS service should be arranged?

☐ Yes ☐ No

Why? ____________________

(4) What other comments do you have regarding the service and its expansion?

____

____

Name ____________________ Firm ____________________

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After completion please return to Alan Taylor, c/o *Computerworld*, 797 Washington St., Newton, Mass. 02160.

Error Reports Simplify Communications Control

By Norman Brooks
Special to Computerworld

The arrival of data communications has added tasks to those already existing for data processing operations managers. At first it appears these tasks can be handled in much the same way those associated with the standard DP equipment in the center itself are handled.

However, this assumption is not really valid. Data communications systems rarely have redundant equipment as do the data center peripherals, nor do they have backup modems, etc., to cope with testing connections

Professional Practices

that are supposed to be in order. In addition, malfunctions of these systems are not as highly visible as those of the central processor.

So while some of the same quality control methods can be used, further work is needed to set up a communications control system.

The communication system certainly needs, for instance, a visible record such as the DP equipment uses. ["Visible Records Help Maintain Service Quality," CW, Nov. 13.] The circuit number and the city or location the circuit is being used to service would replace the serial or model number of the hardware.

However, these visible reports should be supplemented by actual test reports, or "Communication Error Reports." One such report I have used and found to be quite effective is illustrated alongside.

The report is divided into four two-part sections, dealing respectively with the original finding of the problem, the technical diagnosis, the technical repair action and the financial adjustments. In each of the four sections, the left-hand area deals with the actual event, while the right-hand section requires information about the response timing, reports made, etc.

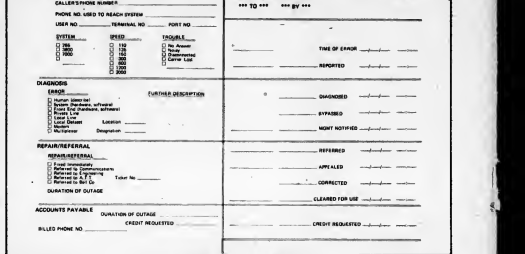
However, a form by itself is inadequate as input to operations management. The contents of the form should be technically precise and precision in communications requires knowledge of the various components of the communication system on the part of the operator handling the trouble reports.

The eight actions I suggest to obtain this knowledge and use it properly are:

- Clearly identify all lines coming into the facility.
- Label each line with the circuit number, associated lines going to the same location and the AT&T repair facility controlling the line.
- Contact the repair facility controlling each line to obtain the names of the supervisor and manager.
- Visit the facility having ultimate control over your lines – such as CAT&T Boston Five Repair Board – and meet with the manager to learn what happens when a trouble call is placed to them.
- Train all operations people in simple checkout procedures of any related equipment so that better information is available sooner when you must make a trouble call.
- Use a simple ac-dc meter to check the db readings of the input and output sides of your lines. Then you can let the repair people know, for instance, that a line is, say, 7 db low on the receive wire at the time a call is made.
- Keep your higher paid engineering personnel for non-standard tasks by using normal operations personnel for preliminary checks. These personnel may be all that you will need for control of data communications.
- Use the Communications Error Report in support of your claims for refunds for line outages.

The Communications Trouble Report, the Communications Visible Error Incidence Report and a trained operations staff ready to use them greatly simplify operations problems and usually result in more reliable service to your installation.

Brooks is an operations manager at Teradyne, Inc., Boston, Mass.



Communications Trouble Report

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Letters to the Editor

Assembler Efficient For On-Line System

David Dahm is batting .333, which wouldn't be bad if he was playing baseball. But it's not worth a dahm for a DP professional addressing a room full of the same ["Assembly Language – Popular but 'Inefficient'" CW, Nov. 20].

Almost anyone in our business who has experience in both Assembler and the higher level languages will agree that the latter are generally easier to use, but the same people will take exception to Dahm's claim that they are "far superior" and "more efficient."

We use a higher level language for all batch processing program development, but for a program to be used in our on-line Customer Information Control System (CICS) we will consider only well-coded Assembler.

We feel that any additional time required in the coding process pays for itself many times every day in the efficiencies of both module size and performance.

Compare the size of a Cobol program module to an Assembler module written to perform the same task. The Cobol module is several times larger. A lot of this increase is additional instructions.

Propogate this increase through 200 application modules in a respectably sized TP system, and consider that some of these programs will be executed 10,000 times daily. This added overhead could cost the difference in an additional storage requirement of 50% to 100% of the size required had the system been written using Assembler, or maybe the maximum number of tasks that will be able to run concurrently.

It's easy to understand Dahm's statement-he works for a hardware manufacturer. We all know that the higher level languages which allow for hardware independence at the source statement level make it easier for users to change hardware to any other manufacturer supporting that language.

Prentice Ethington III
Somerset, N.J.

Cost the Main Factor

David A. Westfall's comments regarding Assembler efficiency [CW, Dec. 11] display a nearsightedness all too common in IBM users who accept the cliches of the trade without enough introspection.

I have worked with a wide variety of languages and have repeatedly found Assembler to rank behind all others in expressiveness, maintainability and debuggability, primarily because of the nature of the language; whereas a programmer thinks in terms of algorithmic steps, he is forced to design, code and debug in detailed machine steps. He is providing the high-level to low-level translation in his mind, but he generally does a poorer job of it than most anybody's Cobol compiler!

I find significant poetic justice in two trends gaining momentum in recent years. First, no matter how many people claim high-level languages cannot be efficient, Burroughs thrives with a major line of efficient machines programmed exclusively in high level languages.

Second, no matter how many people claim Assembler must be efficient because IBM uses it for its own system software, we now see IBM disregarding the masses by developing its major new system software (particularly VS2) in the PL/I-like PL/S.

Westfall draws a key conclusion that programmer competency is the real issue, not language efficiency. I find fault with Assembler instead of the programmer precisely because it encourages programmer inefficiency, which I consider more expensive in terms of design, maintenance, and debugging time.

I side wholeheartedly with Dahm in seeking a more professional attitude from the industry in general as a basis for comparison of hard dollar savings. Lowering costs to my company requires such an approach, and development of the DP industry does also.

Wayne Harvey

Dallas, Texas

No Substitute

This letter is in support of David A. Westfall's letter [CW, Dec. 11] regarding the article on Assembly language [Nov. 20].

Recently, we were faced with the task of matching up the source programs contained in card files with those which we were executing in production from the core image library. Since this involved 400 to 500 programs to undergo validation, we decided to accomplish the task by an IBM 360/30.

The result was the Software Validation System, written entirely in Assembler language. The method used the output of the language translator as the driver in validating the contents of the core image library, i.e., object module vs. load module.

I challenge David Dahm to write *that* in Cobol, Fortran or PL/I. I further dare him to benchmark it against my "inefficient" Assembler version, which, by the way, requires 14K and 6 minutes to validate an average size load module of 32K.

Kenneth J. Germann
The Church Pension Fund
New York, N.Y.

Until Myopia Clears Up

DPers May Not Deserve to Be Called 'Professionals'

By Donald Zitter
Special to Computerworld

In recent months, much has been written, spoken and hopefully thought about regarding the role of the DP specialist within the corporation. A great deal of this activity has been concerned with our professional status – or lack of it.

We in the field have been somewhat remiss in our clamor for professional recognition. We have rightfully claimed that data processing, consisting as it does of a complex technical subject matter with a significant potential for societal impact, puts us in a position to reach out and touch virtually all segments of the population in a negative as well as a positive manner.

What we have missed, however, is the connection between the technology we command and the problems that can be solved by its application.

The doctor, using his knowledge of chemistry, physiology and biology, treats patients' ills; the attorney, aided by his knowledge of the law and legal precedent, insures that all citizens are treated equally under the laws of our country. In short, each of these professionals exists to perform one basic function: the application of a specialized field of knowledge to the solution of someone else's problems.

In fact, if the broad, diverse field of professional occupations was to be defined by a common thread found in each, this theme of solving problems for others would be that common goal.

Can this theme be found in our "profession?" Are our efforts primarily directed toward solving the business problems of our employers?

I think the truth is exactly the reverse. As a group, we have been so wrapped up in the technology itself that we have had little time to use our tools to help our employers in any significant manner. We have devoted so much attention to upgrading our configurations and insuring that the operating system being used is the very latest release that we have lost sight of the big picture.

The way in which we recruit DP experts for staff openings is indicative of the myopic point of view often displayed. When seeking an individual to fill an open position, do we establish as prime requisites the ability to logically approach a situation, define the inherent problems, structure the solution and follow through with the implementation of that solution?

Again, I think not. Instead, what we often define in our recruitment advertisements, emphasize in screening resumes and interview people with the express purpose of establishing is previous experience working with OS VS II on an IBM 370/145 with 15 3330 spindles and seven dual-density tape drives running Customer Information Control System (CICS) in a Cobol shop on Friday. Even the otherwise qualified candidate might be rejected for having only worked in the environment on a Monday-through-Thursday schedule.

This is not professionalism.

Instead of this shortsighted view of ours, dealing as it does almost exclusively with the technology itself, we should be seeking the application of this technology and how it can be better utilized to solve the business problems of our employers. The computer by itself, including all of its supporting operating systems, compilers and data management packages, is only a tool, not an end product.

Unless we realize this and get on with the real work at hand, I am afraid that our employers will soon reach the conclusion that we are really no more than technicians and should be treated as a part of the clerical work force, rather than as the professionals we claim to be.

Zitter is systems manager at the Permutit Co. in Paramus, N.J.

Reader Commentary

Letters to the Editor

Documentation Aid Coming

The editorial call for better documentation [CW, Dec. 4] makes a good point. It is cheaper in both human and financial terms to do the job right in the first place.

But good intentions, even when they are coupled with hard work, are not enough, especially in documenting programs, systems and projects.

It really helps a lot if one knows what one is doing. Sadly, however, most of the guidance material that is currently available is limited to requirements for single programs, generally existing in isolation.

An effort is under way within the Association for Computing Machinery (ACM) to organize a special interest group concerned with documentation that would be open to nonmembers. Interested persons should contact me at 182 Sullivan St., 10012.

Joseph T. Rigo

New York, N.Y.

The UPC Counterculture

Recent articles on UPC fail to mention its great rip-off potential. Supermarkets with scanners will become the most highly patronized stores in the area as customers find out they can paste "cheap" UPC numbers over "expensive" ones.

The poor checkout clerk with a productivity goal of one item per 1.37295 seconds will then be asked to scrutinize every UPC label as man battles the computer. A whole new industrial counterculture of one-cent label reproducers may spring up. Can a fraudulent label perpetrator be prosecuted in the store . . . outside the store? Will it become a federal offense to Xerox a UPC label?

Ron Van Note

New York, N.Y.

INFORUMATION

All about the Computer Users' Forum and Exposition in our January 29th Caravan Preview.

This special issue of *Computerworld* will take an in-depth look at the Computer Caravan Forums and Workshops. These unique, user-only forums provide professionals in the computer community with a meeting ground for dialogue with their peers, where experiences are exchanged and solutions to common problems are shared. In *Computerworld's* Caravan Preview issue, you'll read about these important Forum topics:

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Letters to the Editor

Burroughs Gets Braves Despite Reservations

I read with approval Roger Hoppe's well-summarized comments on the superiority of Burroughs equipment and software [CW, Nov. 6]. My only regret is that I have so little opportunity to work with it.

The sophisticated features of MCP and the ease with which they can be realized demonstrate the talents of Burroughs hardware and software designers.

Despite my obvious infatuation, I have been long disturbed by one major MCP deficiency: the lack of a linkage editor. Although Burroughs representatives are quick to offer the COPY verb as a substitute for CALLs, anyone experienced in modular programming recognizes this as a feeble defense.

One major advantage of modular programming is the reduction in compile time achieved through linking together separately compiled subprograms.

Even the ZIP/FILL capability are unsuitable substitutes. Both being expensive instructions, the FILL verb, which offers a means of interprogram communication, requires that the receiving program be separately loaded and resident in the job mix prior to successful execution. These capabilities are hardly comparable to the advantage provided through a linkage editor.

When I attended a Cooperating Users of Burroughs Equipment (Cube) meeting two years ago, my prime goal was to find out when and if Burroughs had any plans to add a linkage editor to their repertoire of medium system software. The comments I received were priceless – "reps" shrugged their shoulders in obvious bewilderment and "techs" embarrassingly tried to explain the conflict between the MCP philosophy and the link edit concept.

Nevertheless, with the apparent popularity of structured programming and the proven success with which modularity has been employed, it seems a shame that, with the advanced software technology Burroughs has demonstrated over the years, they could not succumb to even one sorely needed IBMism.

John A. Siegel
Siegel Associates
San Jose, Calif.

Getting Liberated

Kent Huckstep rejects "women's libbers suggestions to change the terms: mailman to mailperson," etc. [CW, Dec. 4].

If such a change has actually been suggested, I find it a dangerous oversight. The replacement term should clearly be "personperson."

Ralph M. Jones
Menlo Park, Calif.

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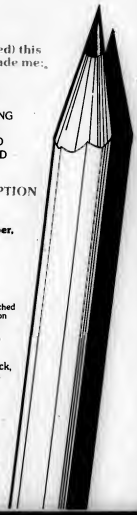

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1974 — Growing Awareness

Government as User Adds Push to CPE Evolution

By Don Leavitt
Of the CW Staff

The maturity that gradually enfolded the user-vendor relationship in systems, utility and application software has been equally evident in the area of computer performance evaluation (CPE) this year. But CPE has shown even more promise of overall good results, perhaps because it has involved the largest user of all, the U.S. Government.

User groups related to CPE have attracted more people than in prior years amid real efforts, thus far only partially fulfilled, to bring the groups together in an effort to avoid duplication of presentations or failure to share experiences on a broad enough basis to gain effective feedback.

In England, too, interest in CPE became evident early in the year when the National Computing Center organized a working party to catalog what tools and techniques are available and determine if possible how valuable they might be. Initial reports from this effort are expected early in 1975, according to industry sources.

Validation Part of Scene

Compiler validation has not generally been considered part of CPE, but observers have finally recognized performance is indeed affected by the quality of the language processor.

The Federal government's Cobol Compiler Testing Service was the subject of one of the well-attended panels at the National Computer Conference. Later in the year, at ACM '74, George Baird received the Grace Hopper award in recognition of his work at the Navy-run testing service.

All Cobol compilers coming into the federal inventory are supposed to comply with the current Ansi standard, but without the testing service, compliance was impossible to validate.

Late in November, the General Services Administration (GSA) put its stamp of approval on the validation routines and the requirement that compilers measure up to the routines by agreeing to draft procurement procedures that will force vendors to make good on any deficiencies within a reasonable, but predefined time frame.

Failure to get the changes done on time would result in the government's considering the vendor unresponsive and therefore ineligible for any further contract awards for the "offending" compiler.

GSA made itself felt more directly in CPE work at mid-year when deputy GSA commissioner Warren Burton told the Computer Performance Evaluation Users Group (CPEUG) meeting in Atlanta that his agency was considering the development of "good" performance definitions for various configurations.

At first it appeared these profiles would be based on working studies run by the Federal EDP Performance Evaluation and Simulation Center (Fedsim), generalized to make the specific project results instructive for other users, without embarrassing the original center studied by Fedsim.

Internal pressures at GSA may have delayed or altered those early goals, but some mechanism for the publication of profiles, perhaps with input from private as well as government studies, is apparently still under consideration.

Kiviats Gain Stature

Kiviat Graphs — named for Philip Kiviat, Fedsim's technical director — gained added prominance this year as a simple graphic display of results accumulated by performance monitoring tools. Though variations of the original values to be charted were developed by various users to reflect their interests or configurations, they cannot effectively be used for analysis, according to Mike Morris, ex-Fedsim project officer who has been preaching the gospel on Kiviat graphs for a year and a half.

Responding to a proposal that values plotted on the circular graphs could be mathematically combined to come up with a single number indicating the subject configuration's effectiveness, Morris used the CPEUG meeting at Columbus, Ohio, to suggest a simpler "figure of merit" which in essence averaged the "good" and "bad" values.

But he warned that the availability of such figures might well encourage users to "settle" for some arbitrarily chosen goal, rather than striving for the best operation.

Meanwhile at least one vendor, Tesdata, has added a Kiviat graph projected on a CRT screen as an optional output of its hardware monitor.

New Yorkers Plan Working Meet

NEW YORK — Users in this area who want to know more about computer performance evaluation (CPE) are invited to attend the initial meeting of the Measurement Group, scheduled for Monday morning, Jan. 13 at Peat, Marwick, Mitchell & Co.

The introductory speaker will be Philip Kiviat, technical director of Fedsim, but the meeting will be keyed primarily to small group meetings, each focusing on particular problems.

An offshoot of the Boole & Babbage Users Group (BBUG), the New York session is free to all comers. The organizers would like, however, to have an idea ahead of time of how many might attend and ask, therefore, that prospective attendees contact either Barry Stevens at Peat, Marwick, Mitchell, or Brenda Rabinowitz at the Federal Reserve Bank-New York.

For Flexible Computing

'Rapidlink' Ties User CPU to Others on Net

FAIRFIELD, N.J. — OS and OS/VS users can access the computational capabilities of Honeywell 437 or Digital Equipment Decsystem-10 equipment, while continuing most of their normal workload, by devoting one region of their in-house CPUs to the Rapidlink service now available on the Rapidata remote computing network.

The network also includes an IBM 370, a spokesman noted, so users might use the new service as a means of handling overflow from the normal in-house processing, in addition to being able to use the "foreign" CPUs and any software packages and data bases that might be unique to them.

The Rapidlink facilities coupled with the network's Data Exchange Unit permit creation of some "very interesting" job streams, the Rapidata source said, allowing, for example, the bulk transfer of data from one machine to another, depending on what processing is most appropriate.

The software installed in the user's CPU to accommodate the linkage functions as an IBM 2780 simulator, much as Rapidata has in its own Tempo communications front ends, a network source said. Ultimately, some of the network's larger customers might have comparable front ends installed at their own sites to release the Rapidlink region for other chores.

The Honeywell 437 is said to provide "general computing services" with access to a number of proprietary data bases. Interactive time-sharing and data base services — as developed by the user through a Codasyl-based data base management system — are the primary uses of the Decsystem-10, according to an industry observer.

The Rapidlink facilities are available to qualified users at no extra charge, according to Rapidata sources. The only costs will be those normally charged for use of the network's facilities.

Rapidata is at 20 New Dutch Lane, 07405.

'Cotune II' Gives Cobol Overview, Details

PHOENIX — Cobol program analysis and measurement is said to be both easier and more comprehensive for IBM 360 and 370 users working under OS with an updated version of the Cotune package from Capex Corp.

The Cotune II package includes changes to the original logic and a supplementary, independent program called Mapper. The analysis thus provided extends the original Cotune capabilities to more detailed levels and to a broader overview as well, Capex explained.

The original Cotune reported, through an annotated program listing, the number of times each Cobol statement was executed and, through a histogram, the percentage of time consumed by the statement.

Cotune II reports execution counts and times for each verb rather than each sentence.

Mapper adds to the other end of the scale. It reviews multimodule systems and identifies which modules consume the most CPU time.

Using this capability as a preliminary, the user can establish priorities for Cotune analysis of individual modules, the company pointed out.

Cotune has been altered to make it more useful during program debugging. It will now print an abbreviated summary report and program listing — with compiler diagnostics — even if errors during compilation prevent program execution.

The normal Cotune report is now prepared from the compiler-generated listing so that diagnostics and other optional printouts can be tied back to the source listing of the program.

Cotune II, including Mapper, is available for a one-time charge of $5,750 or for $275/mo for a minimum one-year lease. Mapper as a stand-alone program can be acquired for $2,450 or for $375 each quarter on a yearly lease.

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Structured Programming—Part 1

Definitions Vital For Cobol Usage to Be Understood

By Michael Karmi
Special to Computerworld

"Structured programming" is becoming a household word in DP circles. Many recent articles have dealt with the theory of structured programming but very few said much about how to use the theory, especially within Cobol programs.

Interest in the theory signals a general tendency toward increasing formalism of software structures and improved discipline of the development process. By moving in this direction, the quality of the product, its reliability and maintainability will be upgraded.

Concepts and Techniques

The most important byproduct of structured programming may be that it makes programs less sensitive to turnover of project personnel.

Some claims are undoubtedly exaggerated but even the more conservative reports suggest we are witnessing the most significant breakthrough in programming technology since the introduction of high-level languages. A recent publication of IBM claims a 400% increase of programming productivity.

Our own, relatively short experience with structured programming already proves a time saving in programming and testing of about 50%, and an unmeasurable improvement in the readability and maintainability of programs.

Two Tools Combined

The technique generally referred to as structured programming is a combination of two management and programming tools. Each one has the potential of facilitating programming performance. However, only the combination of the two will give any significant improvement.

The two components of the structured programming practice are top-down programming development and the application of the structured programming theory.

Common sense dictates developing the highest level in program hierarchy first and working down to the lowest levels. However, this simple and straightforward strategy is not always followed. The resulting "spaghetti" programs often have many loose ends.

Instead, the program should be developed as a hierarchical and highly modular structure. The technique of top-down development is governed by a few very simple rules which must be strictly followed to assure success:

- The whole program should be built as a construction of modules, controlled by a single control module which constitutes the main line of the program logic.
- Every program module may have its own secondary control module (depending on the complexity of the problem) to activate lower level modules or may contain the required statements to execute the designated function.
- Each module should have only one entry point and one exit.
- A module should never activate another module on its own level.
- Individual program modules should be as short as possible.
- Testing and implementation of the program should proceed in a top-down fashion, and "black boxes" or dummy modules which simulate the yet-to-be-developed modules should be used as often as possible.

In such a hierarchical modular design each module performs a defined function which is part of the designated function of the whole program. The net result is that each module is easier to debug and so the whole program is easier to debug.

Structured programming is a variety of modular programming techniques and appears to carry the modularization down to the lowest level of program development, that is, the building of single program statements.

In spite of the similarities between structured and modular programming it is important to recognize that conceptually they are not the same.

The structured programming theory stresses the simplicity in program design and coding. We understand complex things by systematically breaking them into successively simpler parts and understanding how these parts fit together locally.

To solve a truly complex problem requires that all the components be kept as simple as possible. Keeping all this in mind, we can define structured programming as the systematic use of abstraction to control a mass of detail and as a means of documentation which aids program design.

Limited Structures

While modular programming is not a new discovery, the structured theory introduces the idea of building programs, by using only a limited number of logic structures. This theory is based on the mathematically proven Structure Theorem – developed by Boehm and Jacopini in 1966 – which states that any proper program (a program with one entry and one exit) is equivalent to a program that contains as logic structures only:

- Linear sequence – one action done after the other.
- Selection pattern – the conditional selection of one of two alternative operations (IF . . . THEN . . . ELSE).
- The controlled loop pattern – the repetition of an action until a tested condition is true (DO WHILE).

Any large program may be developed by the appropriate nesting of these basic figures within each other. The logic flow of such a program proceeds from the beginning to the end and the program can be read like reading a book.

At this pionit it must be noted that the "orthodox" structured theory calls for complete programs written in a linear, GO-TO-less, top-to-bottom fashion.

However, in our experience we found it more useful to write compact modules each of which is built in a strictly disciplined and structured way. Each module is Performed by a control module which itself has a structured design.

One of the most controversial features of structured programming is the elimination of GO TO statements. Undisciplined GO TO statements make program structure hard to perceive, and are often symptoms of a poor conceptual formulation.

The presence or absence of GO TO statements is not really the issue, however; the underlying structure of the program is what counts. The real goal is to formulate our programs in such a way that they are easily understood. Therefore GO TO statements should be used only as an error exit and the branching is always forward to the exit point of the module containing the GO TO.

In Part 2, Karmi extends the basic concepts to show how they apply in the Cobol environment.

Karmi is a programmer analyst for Worthington Compressors, Inc., Buffalo, N.Y.

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Exclusive sliding doors replace "read-only" plugs to assure a constant write-inhibit/write-enable programming capability. When you want to enter data, slide them closed; when you want to protect it from accidental over-recording, slide them open. Slots are designed to use standard removable plugs, if you prefer.

Hubs have unique one-piece latch that prevents ends of tape from slipping out, even under heavy stress loads. It also eliminates "tails" that can bunch up and cause error-generating irregularities in the tape pack.

0.0007" thick, tensilized polyester base (0.0005") tape is certified end-to-end before it's loaded into the cassette. It's mechanically and elecfronically tested for proper slitting (0.150", −0.000", +0.002"), rippled edges, scratches, shedding, "country laning," noise level, dropouts, and output uniformity (±10% at 400, 800, or 1600 flux changes per inch). Tape can be supplied with ECMA/ANSI/ISO standard BOT and EOT sensing holes at each end.

Tape reel glides smoothly on slip sheets made of a homogeneous mixture of extra high density polyethylene and graphite that has an electrical resistance of less than 10^9 ohms per square.

The K/Tronic multi-layer pressure pad is made of non-woven polyester fiber, with polyurethane foam backing for uniform pressure across tape. No debris or loose threads are present to contaminate tape and cause dropouts. It took almost a year of intensive research to develop a pad material with a low coefficient of friction that would not deteriorate after repeated use.

Rollers are precision molded Delrin rather than machined. This gives them a harder, smoother surface and superior abrasion resistance, while retaining high lubricity characteristics.

Your cassette memory system is only as good as the cassette in it. Five years ago, K/Tronic set out to design a cassette that would withstand even the roughest treatment and keep the tape dropout-free longer than any ordinary styrene or glass-reinforced cassette. Today, after three years of research and testing and two years of volume production, over 60% of all cassette memory manufacturers specify our trouble-free "K/D" certified digital tape cassette. To find out why, call or write Frank Gemellaro. He'll send you a brochure that tells you our whole story. K/Tronic, Inc., 3260 Scott Blvd., Santa Clara, CA 95051. (408) 246-6830. In Europe write: K/Tronic (Europe) Ltd., 10 Salmon Close, Spencer's Wood, Reading, Berkshire, England. Phone: 883538.

K/Tronic

Batch Orders Run on H58

WALTHAM, Mass. – A batch-oriented order processing system is now available from Honeywell as a separately priced package for small- and medium-sized distributors using Series 60 Level 61 and Model 58 CPUs.

The package provides control over all phases of order processing – entry, shipping, inventory, billing and receivables – and accumulates data for sales analysis and commission reports.

Three options for handling prices are provided by the system. Individual prices may be entered along with item numbers and quantities or prices can be calculated from an internal matrix, taking into account discounts based on quantity ordered and, if applicable, other discounts in recognition of the customer's value to the distributor.

The third approach makes use of a price history file containing the last sales activity for each account, including the unit price and quantity ordered for each item.

The software can be used in stand-alone mode on minimum-sized Series 60/61 or Model 58 computers with 5K bytes of memory, two disks, a printer and a console.

The package is available under license for a one-time charge of $4,000 or for 18 monthly payments of $250 each. Documentation and error-correction service "for a limited period" are included, the vendor said.

'Stocs' Updates S/3 Job Stream To Aid Disk System Conversions

FLINT, Mich. – Installations working with IBM System/3s can get away from manual updating of Operation Control Language (OCL) entries by utilizing the System Three OCL Conversion System (Stocs), according to its vendor, David C. Scott, a DP consultant.

Described as a complete procedure library maintenance and conversion system for all models of the System/3 line, Stocs apparently requires a Model 10 for compilations.

The primary function of the utility is to make global changes in all required procedures when files must be reorganized. This might occur when original files become full, when the user is converting from IBM 5444 disk drives to 5445s or 3340s or when drives are being added to improve throughput.

The system works by writing all cataloged OCL from the procedure library to a 96-character card-image disk file, updating any user specified changes and recataloging back into the procedure library.

A modification of the basic library access routine would allow the user to "pull" source library entries and write them out to card, disk or floppy disk for revision, recompilation and testing before they are put back into the library, Scott said.

Stocs is available for through-the-mail installation for $200, which covers source code (RPG-II with some Assembler subroutines), documentation and warranty against defects.

'Symbug' Backs CMS Debugging

NEW YORK – Terminal-based symbolic debugging of programs being developed under the Conversational Monitor System (CMS) of IBM's Virtual Machine Facility (VM/370)–is said to be simplified with the introduction of the Symbug package from Standard Data Corp.

Symbug is an integrated, execution-time support package for the debugging of Cobol, Fortran and Assembler programs.

The package provides a test bed environment for programs under development. it dynamically monitors the execution of the program and enables the user to examine and change data and patch the program logic in its source language.

With an English-like command language, Symbug is used at the symbolic level, avoiding the machine level complexity. All references to data fields are in the same names the programmer used in the original languages.

Programmers interact with their programs in a Symbug environment whenever any of three conditions arise:

- Execution of the program results in a program interrupt.
- Preestablished breakpoints of execution interruption are encountered.
- The user causes an external interrupt. At that time, as in the other situations, the user has available all the facilities of Symbug.

In addition to setting and clearing breakpoints, Symbug allows the user to trace execution of program, subprogram, paragraph name, line number or statement label. Tracing can be keyed to specific verb names, Standard claimed.

Arithmetic and logical expressions may be used as arguments in many Symbug commands. An expression may contain subexpressions, following either Cobol or Fortran conventions of notation and evaluation.

Installation of Symbug takes less than a day and does not require any changes to the CMS nucleus or any of IBM's language processors, the vendor noted. The package can be acquired for $25,000 but lease and rental plans are available, the firm added from 1540 Broadway, 10036.

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COMMUNICATIONS

Plans Nationwide Order Net

Ill. Firm Testing Datran's Digital Dial-Up Service

By Ronald A. Frank
Of the CW Staff

WAUKEGAN, Ill. — A dial-up call was originated from a telephone-type key pad at American Hospital Supply Corp. here last week to connect a Burroughs B4700 CPU with a Four-Phase Systems intelligent terminal. The call was completed in less than one second, and data was transmitted at 4,800 bit/sec without error.

The unusual aspect of this call is that it was one of the first placed by a user on a dial-up service being inaugurated by Data Transmission Co. (Datran). The new service is called Datadial and it is designed to give data communications users a digital dial-up service through Datran's network switch at Brunswick, Ill., south of Chicago.

American Hospital Supply has been testing four lines on the Datadial system for about one month, according to Ralph Willio, DP production supervisor. The firm plans to integrate the Datadial service into its nationwide distribution system which handles order entry and other data from more than 50 locations. The regional offices transmit order information to the central DP site where dual B4700s are installed.

To transmit data, a remote office calls the Waukegan center to get into the polling queue, Wallio explained. The CPU then calls the office back on out-Watts facilities and receives batched data that has been entered into Four-Phase 440 terminals.

The remote offices have clustered terminals that operate with a 72K mini, disk pack and 300 line/min printer. On Bell lines, the data is transmitted to the DP center using Bell 201C data sets operating at 2,400 bit/sec with Ascii code.

American did much of the software interfacing between the terminal systems and the Burroughs mainframe, Wallio said. The network also includes some 1,200 bit/sec asynchronous terminal equipment from Honeywell but this is gradually being replaced with Four-Phase terminals that operate at the higher speed, he said.

Bell Weaknesses

American Hospital decided to test the Datadial service because of weaknesses it has encountered with the Bell dial-up network, Wallio explained. The greatest weakness is that Bell personnel have limited effectiveness in troubleshooting problems that occur on dial-up circuits. Bell technical teams have extensive experience in isolating private-line problems but their capabilities for dealing with dial-up circuits are not as developed, he said.

In addition, Wallio is hesitant about upgrading his transmission speed from 2,400 to 4,800 bit/sec because he is not sure he can maintain his current reliability levels with Bell. On the other hand, Datadial offers higher speeds with faster connect times while promising lower error rates, he said.

Although the obvious reaction to a bad dial-up connection would be to redial, Wallio said this is not a good solution. "It's not very effective. It takes about 10 to 15 seconds for a call completion and our automatic calling equipment requires an abandon call retry interval of about 24 seconds. We lose 24 seconds of port time with each timeout interval.

"When you are running a 'tight' system handling about 3,000 calls per day, you could operate more efficiently if you knew each call was going through," he said.

"What is more important is that on good calls it takes between 10 and 15 seconds to set up a call through to the automatic answer tone with Bell. With Datadial it takes less than a half a second to set up a call."

There are still limitations in the geographic areas that will be served when Datadial officially begins in January. It will be available along Datran's private-line routes which include Chicago to St. Louis and south into Dallas and Houston. From there the network will be expanded west to California under agreements with Southern Pacific Communications Corp. to share facilities.

American Hospital presently is testing four Datadial circuits. Three of these are connected to a developmental terminal at the DP center and two others are in Dallas. Early in the new year, sites will be added in Houston, St. Louis, Los Angeles and San Francisco.

In order to connect to Datadial service, American uses a Datran Datalink terminal which includes a keypad, status indicators and control keys. The call is completed without any audio indications and an indicator light tells the operator that the call has been connected. When Datadial is operational, automatic dial equipment will be used.

Not All Digital

The Datadial circuits being used by American Hospital are not totally digital from end to end. From Waukegan the network link includes a four-wire Bell facility to the Datran terminal at the Hancock building in downtown Chicago, a distance of about 32 air miles.

As far as the user is concerned the end-to-end facility might as well be all-digital since any required signal translations are handled by Datran, Wallio said. At each site Datran installed a data channel controller which includes a built-in modem.

The digital portion of Datadial runs between the Datran terminals, and the network switch is also a digital device. Only the local loop portions rely on Bell lines.

Initially the swich to Datsdial will cost more than the Bell dial-up network because American will have a "split" network, Wallio said. But by the end of 1975 he expects to have most of his major terminal locations served by Datadial.

When the entire net is running on the Datran service, Wallio estimates he will be operating at one-third the cost now charged by Bell. At .4,800 bit/sec American is paying 2 cents per mile per minute plus $140/mo for the data channel controller. Installation adds another $200.

These rates are tentative and could change when the Datadial tariff is filed. Tentative rates at 2,400 bit/sec are 1-1/2 cents per mile per month, and at 9,600 bit/sec they are 3 cents per mile per month.

Rates for the channel controller range from $130/mo to $150/mo depending on speed of transmissions.

Clarification

MAYNARD, Mass. – The development of a new data communications protocol at Digital Equipment Corp. [CW, Dec. 11] was a team effort, accomplished in six weeks. The Digital Data Communications Message protocol was the result of work done by George Friend, Stuart Wecker and Steve Russell, according to a spokesman.

Equipment, Not Lines, Troubles Users Most

By Edith Holmes
Of the CW Staff

Faulty equipment causes more problems for communications users than do telephone lines, a recent *Computerworld* survey indicated.

A majority of the users contacted in a random survey cited hardware failures of terminals and printers as the chief sources of trouble in their communications networks. Very few commented on the deficiencies of lines, either dial-up or private, and only one user complained about his Bell modems.

Difficulties were found with equipment produced by several vendors, including IBM, Burroughs and Univac. And, in some cases, users reported poor vendor service support as well.

Implementation of IBM's Customer Information Control System (CICS) teleprocessing monitoring system, has also created problems in a few instances, the survey found. One steel manufacturer said "the lack of trained technicians available from IBM has resulted in lousy support from the corporation."

But when overviewing their communications systems, most users agreed the problems they've encountered were not unexpected and said they are generally pleased with their networks.

Line Problems

What line problems were reported came from a religious organization and a manufacturing company, operating out of Yonkers, N.Y., and Dayton, Ohio, respectively.

Using dial-up lines to link a Univac 9400 and two remote DCT 500 terminals, the DP arm of the Archdiocese of New York had problems at the intersection of an old crossbar and a new Touch-Tone exchange.

"It's a disconnect problem," the DP director commented. "We can't get the terminals shut off."

The Ohio-based Mead Corp. reported trouble communicating with customers in the South and wondered how much control AT&T has over lines in that part of the country, according to a data communications specialist at the company.

Of those interviewed, 70% said the economy hasn't affected their 1975 plans at all. "We have a bigger problem: we have a new mayor," one city DP manager remarked.

Those who have felt the pinch have generally postponed the purchase of new equipment. One user plans to buy additional CRTs, however, to avoid paying rising paper costs.

"With daily reports for salesmen obsolete by noon, we could easily justify the cost of the extra CRTs," he said.

The majority of those surveyed also expect to add new applications next year. Primarily on-line through CRTs, these applications will range from mortgage loans, fund-raising projects and sales orders to raw materials processings, inventory control and a general management information system for a city police department.

The survey indicated most users consider on-line applications somewhat more reliable than remote batch processing. "With on-line, we have immediate editing capability," one DP manager noted.

Happy With Two-Site Trial

Department Store Chain Pioneers IBM Retail System

By Edith Holmes
Of the CW Staff

LITTLE ROCK, Ark. – With a wave of the wands in its newly installed retail store system, a department store chain based here expects to whisk its way through the heavy buying of the Christmas season.

Featuring point-of-sale terminals with electronic wands to ring up purchases at sales counters, the IBM 3650 system has been installed at two of Dillard Department Stores, Inc.'s 31 operations, one here in Little Rock and the other in Lubbock, Texas, according to Carolyn Battles, project manager for the Arkansas installation.

Dillard leased the first retail store system to be offered by IBM because it combined the functions of an advanced cash register with those of a computer entry device. It also provided a ticketing machine for labeling merchandise with magnetically encoded price tags containing inventory information, Battles said.

Terminal Transactions

The system installed at Little Rock in July includes 50 terminals with hand-held wands for reading the magnetic price tags located at sales counters throughout the store's three floors, she noted.

To begin a typical cash transaction, the salesperson enters an identification code via the IBM 3653 terminal's keyboard and then passes the wand reader over the magnetic strip on the price tag, without removing it from the merchandise, Battles explained.

As the clerk "wands" each item in the purchase, the terminal automatically records and prints information describing the item and displays its price on a lighted display panel. To complete the purchase, the device computes the amount due including applicable taxes, calculates the change to be returned and prints a cash receipt and a journal tape.

Meanwhile, the terminal has captured item information – such as merchandise class, size, color and price – for inventory control, Battles said.

Information entered into the system through either the wand or the keyboard is then transmitted through an IBM 3651 controller over private telephone lines to the chain's central computer. The IBM 370/145 mainframe is located in administrative offices three miles away.

Battles commented that in order to improve communications between the controller and the terminals, a new system generation was implemented on the 370/145 and then loaded into the controller. One unexpected result was a decrease in response time between terminal and controller from 15 seconds to three to four seconds, she said.

"While we haven't yet measured the reduction in the time needed to finish customer transactions, our clerks have noticed significant differences in the time required to complete a purchase," Battles remarked. In addition, because detailed information about the previous day's sales is now immediately available, the store's buyers have sales data five days faster than before, according to a company official.

. . . And Over in Texas

Similar results have been obtained in the Lubbock store where 44 IBM terminals were installed last September. The same equipment is used to link this system to the mainframe in Little Rock, with the exception of the modem, Battles noted. While the store in Arkansas has an IBM 3872 modem, the Lubbock operation uses a 4,800 bit/sec data set leased from the Bell system.

Both stores rely on the IBM 3657 ticketing machine located in the Little Rock warehouse to produce price tags.

While customer reaction to the new systems has not been formally surveyed in either store, Battles contended customers "are very pleased and impressed" with the terminals and their wands. "They often ask how the wand works and where the information it picks up is going," she said.

Beyond customer reaction, Dillard itself is satisfied with the 3650 system. Battles noted that while the chain originally leased the system for its encoding capability, management has come to appreciate the ability to load terminal controllers from the host machine.

Plans are now under way to install the retail system in three more stores during 1975, she reported. An as yet unspecified number of terminals will be installed at one store in Wichita Falls, Texas, and at two operations in Shreveport, La.

Dillard has also installed IBM 3277 display stations in its Little Rock distribution center to eliminate paperwork associated with the execution of buyer's orders, she said.

Digi-Log Portable Terminal Has Blinking Characters

HORSHAM, Pa. – The Digi-Log Systems, Inc. portable data terminal is designed to replace or operate in conjunction with Model 33 Teletypes. It can optionally provide blinking characters and blinking cursor.

Weighing less than 10 pounds, it can be carried in a briefcase and plugged into a video monitor or network of monitors for large audience viewing, a spokesman said. It can also be acoustically coupled or hard-wired to a communication line.

Current loop, TTL or EIA RS-232 interfaces are provided with standard data rates at 110- and 300 bit/sec when using an optional acoustic coupler. Up to 9,600 bit/sec speeds can be handled in hard-wired configurations.

Two models of the data terminal are available. The Model 209 features a display of 16 lines, 40 char./line. It sells for $1,195. The Model 33 has an 80 by 16 line display and sells for $1,295.

Delivery is 30 days from Babylon Road, 19044.

1974 Retrospect: Mini Advances Take Center Stage

By Vic Farmer
Of the CW Staff

Beset with rising development costs, high interest rates and the lack of real knowledge of just what IBM will finally announce as its Future Systems in 1976, independent mainframe and peripheral manufacturers generally had little to offer the larger installations in 1974. But mini-computer-related firms more than filled the gap.

It was the year that "putting a minicomputer system together" slowly broke free of the in-house electronic engineer requirement. Satellite data entry and data processing aroused greater and greater interest, and dedicated minicomputer-based systems to handle functions such as data file management and in-house time-sharing started to provide a real challenge to the proponents of one big system to do all things.

Much of the impetus to return minicomputers to the domain of the "common man" came from the major minicomputer manufacturers in the form nicely packaged "typical" systems. These typical systems generally tied a couple of CRT terminals, variable amounts of disk storage, an IBM-compatible tape drive and a printer to an easily adapted mini package.

Even the most dedicated of OEM-oriented companies, such as Microdata in its Reality system, took the bull by the horns and came out with end-user systems complete with operating systems and language compilers.

Digital Equipment, Varian Associates and Hewlett-Packard announced a veritable catalog of special groups of equipment tagged for one application or another.

Key-to-disk systems companies such as Inforex regrouped to investigate and even produce mini-based systems to handle applications such as data file management (Inforex Series 3000).

And another level away, the intelligent terminal makers such as Sycor, Datapoint and Wang Laboratories presented their users with aggrandizements ranging from floppy disks to additional tape drives, printers and other packages.

Independent miniperipheral manufacturers in many cases led the parade to interface card and tape readers, floppy disks, IBM-compatible tape drives, printers of all descriptions, add-on memories and even IBM 3330-type disk drives to a nearly all-inclusive line of major minis.

In the mainframe area, IBM quite naturally held the spotlight pacing out its announcements. Other than several major communications-related announcements, the most interesting new product was the 3850 tape cartridge system which was touted to extend virtual storage a step lower in the magnetic memory hierarchy.

The firm filled in gaps in its System/3 line with the Model 8 cardless system and the 3340 disk drive option. For larger users IBM even added a fixed head to the 3340 which is said to improve indexing performance.

Unlike recent years, the "independent" peripherals makers did not hold center stage in 1974.

Control Data and Cambridge Memories did introduce 370/155 accelerators and 200M-byte 3330-type disk drives.

The most interesting independent peripheral came from Honeywell with its IBM-compatible 200 page/min electrostatic printer.

As to the "other" mainframers, Control Data revamped the electronics in its Cyber 70 Series to come out with an equivalent Cyber 170; Honeywell revealed a Series 60 with 11 models that use microprogramming bridges to join the old GE and Honeywell system users together.

NCR added somewhat competitive peripherals to its line as well as a couple of "line-filler" CPUs.

Burroughs released a new processor for its 7700 Series that the company claimed would "double throughput" and introduced a new front-end processor and mid-range 4790, both using bipolar semiconductor memory for the first time in the company's line.

Univac's major thrust centered around its 1800 keypunch – "the final answer" – and its 1900 key-to-disk system. It never did finish announcing its 90 Series.

DEC announced an upgrade for its Decsystem-10 – the KL10, and ICL returned to America with its 2903 small system.

Saves $118,000/Year

Souped-Up 50 Right on Target as 370 Replacement

By Patrick Ward
Of the CW Staff

VALCOURT, Quebec – A "downgrade" from an IBM 370/135 to a 360/50 from a third-party lessor has saved Bombardier Ltd. $118,000/year in hardware costs and brought a small throughput gain besides.

Bombardier, maker of snowmobiles, foresaw "tough sledding" ahead last year and ordered a general cut in expenses.

The firm's DP department considered substituting either a 370/125 or 370/115 for its two-year-old 370/135, but decided both machines were too small, corporate data processing director Tim Flessas remarked.

Before the company upgraded from a 360/40 to the 370/135, it had considered going to a 50, Flessas recalled, but the 370 did not cost that much more at the time and a third-party agreement would have tied the company in with the 360/50 for a longer period than Bombardier wanted.

"Benchmarks also showed that the 50 was about 50% slower in throughput than the 370," Flessas said.

Last year, however, the DP director asked third-party lessors for a 50 and had proposals from Greyhound Computer Corp., Boothe Computer Corp. and Dearborn-Storm Corp.

Flessas decided on a 256K 360/50 from Boothe that uses a DOS/RS operating system from Dearborn. The package also includes a 16-spindle 2314 disk system with a two-channel-switch 2844 controller and a 2701 communications adapter.

The 244K 370 had been operating under IBM's DOS with a 14-spindle 2314 system under a 2314A control unit and an integrated communications adapter.

Bombardier kept three IBM 3420 tape drives leased from IBM and a 1403 N1 printer, but put them on an Extended Term Lease.

Better Throughput

Bombardier's "new" 360 system was able to match and surpass the 370's throughput, Flessas said.

The dual-switch 2844 controller helps because it allows the CPU to access the disk drives through two channels instead of one as on the 2314A.

"With a large data base and a Data Base Organization and Maintenance Processor (Dbomp) bill of materials file, you waste too much time waiting on a single channel," Flessas remarked.

The DOS/RS operating system, which Dearborn programmed to support the 2844 controller, also provides the user with six partitions, allows compression of core image or relocatable libraries and offers fairly comprehensive job accounting and system evaluation capabilities, Flessas said.

The latter features helps "our scheduler a lot because you get a report that says you should have scheduled this way, the mix is not right . . . you're I/O-bound on one partition and CPU-bound on another," he explained.

The 360's 12K of extra core also brings a "little more flexibility," Flessas mentioned.

Since both IBM mainframes were under DOS, the transition from the 370/135 to the 360/50 went smoothly, Flessas recalled. "Our programmers had to do some additional work to re-link-edit our programs to take advantage of the compression and relocatability of programs" under the DOS/RS operating system, he noted.

The Bombardier data center does batch processing of Cobol, Fortran, RPG-II, PL/1 and Assembly language programs. Its application systems cover finance, order entry, billing, accounts receivables, general ledger, accounts payable, and sales statistics systems, Flessas noted.

In the manufacturing areas, the firm handles an extensive Dbomp file, uses IBM's inventory control package and runs materials requirements planning and shop floor control systems.

Marketing work includes forecasting and a warranty system with two million names and addresses.

Two IBM 3780 remote job entry terminals are used to transmit data from remote sites. The 360 system offers another advantage here, since "we did have some problems with the integrated communications adapter with the 370. Since we have a separate 2701 controller now we don't seem to have those problems," Flessas said.

The shop uses Librarian and Autoflow from Applied Data Research, Epat from Software Design, Inc. and some small packages that "allow us to access Dbomp files through RPG-II," he added.

Although it costs $118,000/year less than its predecessor, the 360's downtime is about the same, Flessas concluded.

IBM Ups Storage Of 370/115 to 190K

WHITE PLAINS, N.Y. – Users of IBM's smallest virtual storage system, the 370/115, are getting more real storage.

IBM last week announced that it would increase the maximum storage capacity on the 115 from 160K to 192K in order to "boost processing productivity."

In addition, IBM said the increased storage would "enable users to grow into and expand low volume data base/data communications applications."

First customer shipments of the 115 in the new memory size are scheduled for the second quarter of 1975 and field upgrades of installed systems will begin in the third quarter.

The 115 in the new memory size will rent for $4,115/mo and carries a purchase price of $187,000.

Regional Sales Offices: Boston (617) 890-3085 • Chicago (312) 671-0102 • Columbus (614) 888-0722 • Canada (613) 737-0041 • New York (203) 762-8351
Los Angeles (213) 679-0045 • San Francisco (415) 566-8461 • Seattle (206) 624-9020 • Denver (303) 794-4231

'Datadraft' Turns Sketches Into Drafts

LEXINGTON, Mass. – Datadraft, a computer-aided drafting system from Dimensional Systems, Inc., uses a microprogrammable processor and disk operating system to create finished drawings and an intelligent data base directly from engineering sketches.

Panel Guides

Interactive operation is said to minimize operator error through the use of an alphanumeric display panel which guides the operator through each step of the procedure, using English language messages and status information.

The data base is structured to allow direct postprocessing as well as file manipulation and control, according to the firm.

To generate the finished drawing (and data base), the operator places the designer's original sketch on the digitizing station and enters positional information via a stylus or cursor. Text is entered through an integral alphanumeric keyboard and is automatically justified and inserted at the correct position and angle.

The basic processing system is provided with 64K bytes (expandable to 256K bytes), in addition to the 5M-word disk system.

Up to four graphic input stations can be operated simultaneously from one computer master station with the ability to plot in the background. A typical E-size schematic can be completed in six hours, compared with about 30 hours for a skilled draftsman, according to the firm.

The price for a typical ready-to-go two-station Datadraft system with plotter is $125,000. Dimensional Systems is at 31 Hartwell Ave., 02173.

Bits & Pieces

Intermem Adds Memory to 195

WAPPINGERS FALLS, N.Y. – Intermem Corp. can now add memory to IBM 370/195 mainframes in 1M-byte units without jeopardizing IBM maintenance on the CPU.

The use of the Intermem 7195 memories on a 195 CPU substantially reduces the total system cost, the firm said. For example, a 4M-byte 195 that has been fully upgraded with Intermem 7195 units costs less than two model 168 CPUs, each with 3M bytes of storage. But the single 195 has more computing power than two 168 CPUs, the firm said.

The firm is at Market St., 12590.

Memorex 40 Down to $9,500

BOSTON – American Used Computer Corp. has recently repriced a Memorex 40 with 48K, originally priced at $130,000 at $9,500.

A complete system, including a 48K CPU, 29.4M-byte disk drive, 600 line/min printer and 300 card/min reader, is priced at $39,500. Other peripherals are available from the firm which can be reached at P.O. Box 68, Kenmore Station, 02215.

Memorex Delivers 200M-Byte Disk

SANTA CLARA, Calif. – Memorex has delivered IBM 3330-11-type plug- and media-compatible disk drives to Omnis Corp., the data processing subsidiary of Sammons Enterprises and Reserve Life Insurance Company of Dallas, Texas.

The Memorex 3675 consists of two independent disk drives with a storage capacity of 200M byte/drive and 400M byte/module, with data transfer rate of 806 k/byte/sec.

In applications requiring large data capacity, the Memorex 3675 offers economic and performance advantages to the user over single-density drives. For example, one 3675 double-density module provides the same data storage capacity as two Memorex 3670 single-density drives at a savings of over 30% per byte.

The design of the 3675 allows the recording heads to "fly" approximately 30% farther from the disk surface than does the IBM 3330-11, with equal recording performance, Memorex said.

This is the second contract awarded to Memorex by Omnis over the past several months. In October, Memorex completed its first field upgrade of a Model 3671 into a 3672 storage control unit and installed a 3673 disk controller at the Dallas-based computer center.

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HAPPY NEW YEAR?

Year-End Review

A Computerworld Special Report December 25, 1974 - January 1, 1975

Innovation Could Temper Gloomy '75 Outlook

Despite gathering economic storm clouds, the DP center may have a unique opportunity to contribute to corporate efficiency in the coming year. As top management looks for ways to cut costs and increase productivity, the innovative DP manager has the capability to become an even greater corporate asset. It all depends on how well the DP staff can apply its resources.

Large Mainframe Prices Climb As Minimakers Declare 'War'

By Vic Farmer
Of the CW Staff

Surrounded on all sides by raging inflation and recession, the computer community is in the midst of a price paradox. The big standard mainframe manufacturers carefully follow the price increase guidelines set down by IBM, while the minicomputer manufacturers have blasted themselves into a full-scale price war.

The minicomputer price war, however, is not just cutthroat competition aimed at eliminating weak sisters, but is an electronic technology war.

Every new chip or miniaturization integrates more and more circuits into a smaller and smaller integrated package . . . fewer packages require less manufacturing assembly cost and less space . . . and this all translates into less expensive systems for the end user.

Prices for mainframer end users turned topsy-turvy after IBM announced major price increases on Sept. 18. The most significant price increase most closely followed by other mainframers was the straight 8% increase in maintenance charges.

But IBM hardware increases ranging from 6% to 8% on various DP equipment separated and pinpointed the strategy of the individual manufacturers.

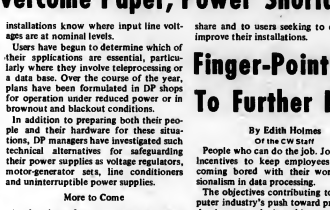
IBM's heaviest increases, 8%, were on the high-end 370/145, 158 and 168 CPUs and the low-end System/3 models 6, 10 and 15. Mid-range prices on the 370/115, 125 and 135 were upped only 6% and most peripherals and terminals were pushed up 6%.

Univac instantly reacted to IBM's pricing strategy with an average increase of 6% on its Series 90 and 1100 lines. Honeywell followed with 6% to 9% increases on its new Series 60s and older 600 and 6000 CPUs, but only 4% on its 200 and 2000 systems.

Control Data raised prices on its new Cyber 172, 173 and 174 by 7%. The older 72, 73 and 74 went up 5%, while peripheral increases ranged from 3% to 7% and terminals were up 7%.

Burroughs, on the other hand, raised prices on small systems about 1%, medium-sized systems, 3% to 6%; and large systems between 2% and 5%. Maintenance prices, however, will be up only 5%.

Xerox was the last mainframer to up prices and went the standard 8% route except on its purchased 530, 550 and 560 CPUs. These units are basically in competition with the high end of the price-warridden minicomputer market.



The minicomputer battlefield lines were drawn basically by Digital Equipment Corp. and Hewlett-Packard as they announced "packaged popular configurations" of minicomputers and peripherals at discounts ranging up to 10%.

But HP was the first to capitalize on the lower cost 4K random-access chip (RAM) with its announcement of its 21MX minicomputer. At first limited only to OEM customers, the 21MX became a lower cost, one-for-one substitute for the firm's 2100 minis, and the "packaged popular configurations" dropped another 10% by year end.

Data General announced its Eclipse series and then its 830 mini, and these two new products gave increased cost performance and lower effective prices (up to 33% lower) compared with its standard Nova 840.

Varian came out with its own series of price drops on various peripherals, citing increased production run economies for price cuts also ranging to 10% on certain items.

Modcomp introduced its 32K-word core board with equivalent savings of up to 27%. HP finished the year with the announcement of its 3000 CX systems that undercut its own 3000 system prices between 10% and 15%.

DEC finally announced its 4K chip PDP-11/04 series as a lower-priced, entry-level system for potential users.

All in all 1974 was the year of the maxi/mini price paradox, wherein price competition on the mainframes was "protected" by IBM, but wide open and beneficial for users in the minicomputer arena.

Users Seek to Overcome Paper, Power Shortages

By Edith Holmes
Of the CW Staff

Learning to live with less of everything while trying to produce more of everything has become the mission of data processing installations faced with increasing supplies shortages and greater service demands.

Last winter's oil and power deficiencies have been temporarily replaced by this year's lack of paper.

Some observers argue shortages are being manufactured by large corporations seeking larger profits. But for most users, whether the deficiencies are "real" is irrelevant.

Prices are up, creating induced shortages due to limited budgets. "If you're willing to pay, you can get all the paper you want," one reader commented in a letter to the editor this summer. And most will soon be unable, let alone unwilling, to pay.

But while a desire for higher profits may provide part of the motivation behind higher prices, marked-up values also indicate that suppliers of goods and services may be fighting to some degree for raw materials. In the long run, scarce resources will make shortages real, regardless of prices or profits.

Like everyone else, data processors must embark on a search for alternatives. This year they must find a means of avoiding downtime and equipment failure due to more frequent power variations; for next year, they must evaluate the options to paper-oriented reports and records.

Because computer installations can suffer great and sometimes irreparable losses of data when an unexpected blackout occurs, many DP departments and service bureaus have taken steps to insure the "cycling down" routine necessary to preserve information and equipment.

In some areas, coalitions have developed between users and lighting and power utilities where data processors provide the power companies with optimum allocation schedules and utility officials let DP installations know where input line voltages are at nominal levels.

Users have begun to determine which of their applications are essential, particularly where they involve teleprocessing or a data base. Over the course of the year, plans have been formulated in DP shops for operation under reduced power or in brownout and blackout conditions.

In addition to preparing both their people and their hardware for these situations, DP managers have investigated such technical alternatives for safeguarding their power supplies as voltage regulators, motor-generator sets, line conditioners and uninterruptible power supplies.

More to Come

In the view of many managers, coping with power shortages readied installations for dealing with the lack of paper.

Faced with cost increases anywhere from 50% to 200% depending on the kind of paper they required, DP shops acted more rapidly to plan paper orders far in advance of actual use. Users also began investigating such alternatives to paper use as computer output microfilm (COM), employing more print positions per line and the outright elimination of many reports.

When surveyed by *Computerworld* in late November, many DP managers said by finding alternatives to paper records and reports next year, they hoped to anticipate other shortages in areas like storage space and computer time.

Other shortages may be more difficult to avoid, however.

One year ago, a study released by Blyth, Eastman, Dillon & Co. suggested enough momentum from current strong orders, backlogs and shipment rates existed to carry the DP industry through 1974 unless a worldwide depression developed.

Now, at the close 1974, we may be facing just such a depression in 1975 that would seriously limit the capital available both to vendors looking to develop new technologies and increase their market share and to users seeking to expand or improve their installations.

Finger-Pointing Mars Efforts To Further DP Professionalism

By Edith Holmes
Of the CW Staff

People who can do the job. Job-oriented incentives to keep employees from becoming bored with their work. Professionalism in data processing.

The objectives contributing to the computer industry's push toward professional development during this past year are much the same as they were the year before. And so are the obstacles blocking their fulfillment.

At the National Computer Conference (NCC), at the annual meeting of the Association for Computing Machinery (ACM), in the letters and columns of this newspaper, business data processors and computer scientists continue to throw sticks and stones at each other and occasionally to break the bones of professional development.

Perhaps next year will mark the end of conference sessions focusing on who has failed to educate those entering business data processing. Instead of pinpointing those to be blamed, we may discover the value of emphasizing business's responsibility to look beyond the improvement of courses and curricula generated within its particular vacuum.

The involvement this year of various professional societies in the goals of professional development does provide an encouraging note, however. For example, as president of the Association for Information Processing Societies (Afips), George Glaser has devoted two major speeches – the NCC '74 keynote and an address at the 10th annual Educom meeting – to this subject.

NCC '74 itself used several sessions as a means of bringing computer scientists and business data processors together.

Those working in the industry can take heart from the ACM council's interest in meeting the needs of its business-oriented members through an additional revised monthly publication stressing the applied, rather than the theoretical, side of DP.

And educators have only to look at the in-house training efforts of many companies to realize their commitment to a professional approach to data processing.

Particularly in the area of career pathing for their employees, many companies have expended considerable time and effort to match job descriptions with required skills and then to provide the training necessary to meet these requirements.

Letters from readers have related instances where business data processors and educators resolved their differences sufficiently to create degree programs combining the practical experience available in a data processing environment with the theory of computer science courses.

But such instances of cooperation remain few and far between.

"Colleges are far too bombastic to provide computer science training on a practical level, and business has gotten its DP training from data processing specialists who are hung up on trying to make everyone a programmer or a supertechnician," one reader commented. "Both colleges' and businesses' attitudes must change."

Maybe they will . . . next year.

Congress Steps In to Protect Privacy of Personal Information

By Nancy French
Of the CW Staff

Public concern over privacy violations in computer systems that routinely store and swap billions of personal records on U.S. citizens was translated into a whirlwind of legislative activity on Capitol Hill this year.

The issue made an odd couple of Rep. Edward I. Koch, a liberal New York Democrat and colleague Barry Goldwater Jr., a conservative California Republican, who jointly introduced the "Koch-Goldwater bill."

Based largely on a report by the Department of Health, Education and Welfare Advisory Committee, the measure was, for most of the year, favored by many right-to-privacy proponents.

The Koch-Goldwater bill covered both private and government data banks. No business, private organization or government agency could have maintained data banks on individuals without informing the people whose records the files contained, according to the provisions of the bill. In addition, citizens would have had the right to access the information and change it if it were inaccurate or incomplete.

The measure also would have prohibited the use of the Social Security number as an identifier except where specifically permitted by law.

To oversee implementation of the act, the Koch-Goldwater bill borrowed from an earlier Koch effort a full-time, five-man federal privacy board appointed by the President and confirmed by the Senate.

On the Senate side, a similar bill was introduced by Sam J. Ervin Jr. (D-N.C.). His bill went even further and included the highly controversial criminal history records.

Shortly after introducing the bill, Ervin stimulated more concern over privacy with the announcement of the findings of a four-year study of government data banks. The study revealed the existence of more than 858 data banks maintained by agencies of the U.S. Government alone.

Ervin found that, in general, little regard was paid to the privacy of personal information in government computers.

Of those agencies that maintained the data banks, 40% reported that citizens were not told records were being kept on them.

Fifty percent reported that data subjects were not permitted to review or correct files.

Where review was permitted, the study found that citizens were not informed that files were being kept on them, so few requested permission to review files.

Information stored in 60% of the data banks was routinely shared with other agencies, the study said.

As for security, locking the computer room and tape library door was all the security most agencies provided.

Accuracy of data became still a larger issue with Ervin's findings that 40% of the files were based on third-party information and 70% were derived from files set up for different purposes.

Legislative hearings in April and June brought forward spokesmen concerned with all aspects of the issue, and views began to polarize. The wide range of opinions soon made it apparent that any legislation passed this year would have to be only a beginning.

Sen. Ervin from the private sector urged legislators to "get the government's house in order" before passing legislation that would affect the private sector.

While Senate proponents pressed for an omnibus bill, industry representatives as well as the National Bureau of Standards' Institute for Computer Sciences cautioned legislators not to pass a law that would be "technologically impossible to implement."

The emerging legislation, far from the original terms of Ervin, Koch and Goldwater, is a starter.

Limited to the Federal Government and overseen by a part-time study group, the bill will serve as a foundation for future legislation. If, indeed, privacy safeguards can be built into data management systems in the public sector, legislators interested in enacting legislation to cover the private sector will have the benefit of experience behind them.

It's Only a Beginning

Despite the interest in citizen's privacy rights engendered by concern over Watergate bugging, telephone taps and other government surveillance practices, the 93rd Congress, dubbed by some the "Privacy Congress" has left literally untouched three key violation-prone areas: criminal justice records, data banks maintained by the private sector and state and local government responsibility for tax and welfare records.

Sen. Sam J. Ervin (D-N.C.), the leading privacy proponent, was unable to get House support for privacy restrictions on the use of criminal justice records in the general bill and will retire this month, leaving future legislation in other hands.

Of two criminal justice privacy bills, S. 2963, introduced by Ervin, and S. 2964, introduced by Sen. Roman Hruska (R-Neb.), at least one will be reintroduced next year.

Staff members are still working with Ervin and Hruska over technical issues that divide them on S. 2963. A bill supported by both would stand a better chance of passage next term.

Although S. 2963 enjoyed the support of Project Search as well as many local law enforcement groups, opponents within the Justice Department and the Federal Bureau of Investigation assured its defeat.

Also in the wings is a third bill, drafted by the Domestic Council Committee on the Right of Privacy, supported by the Justice Department. A softer measure then those considered to date, the bill would provide individual access to criminal history information and confine use of investigative and intelligence records to criminal justice agencies.

Access to such records by employers and licensing boards would be left to the states under this bill.

As for data banks maintained by the private sector, legislators are taking a wait and see attitude – hoping to learn lessons as a result of implementing privacy legislation within federal agencies.

However, measures such as the privacy amendments to the Fair Credit Reporting Act to cover credit data banks, are still pending. With support already pledged by the administration, there is a good chance of passage next year.

Domestic Council Gives White House Support

By Nancy French
Of the CW Staff

While national attention has been focused on the congressional debate over the final shape of this year's privacy legislation, the Domestic Council Committee on the Right of Privacy has been working with federal agencies behind the scenes to draft specific regulations that will meet the requirements of the new law.

Established by former President Nixon and originally headed by then Vice-President Gerald Ford, the committee is intended as a "top-level review of the entire issue of personal privacy." Since May it has made efforts to determine privacy implications in legislation and administrative decisions under consideration.

A committee spokesman said that to some extent it has assumed an implementation role much like that of the "privacy commission" described in early versions of the privacy legislation with one distinct difference.

"Rather than doing all the study and staff work ourselves and then selling the ideas to the agencies, we have stimulated interest among agencies to draft regulations that all agencies will follow in meeting the privacy requirements of the new law," he said.

While somewhat hampered by the delay in Gov. Nelson Rockefeller's confirmation as Vice-President, and therefore, chairman of the committee, the unit has contributed to developing legislation and executive orders in large part by representing the views of federal agencies.

In addition, the council has taken a lead in several specific areas:

The final touches of a privacy safeguards plan where agencies would be required to document systems and install data security safeguards are waiting for Congress to vote on the bills now before it.

A plan for classifying data bases by sensitivity and then suggesting software and hardware security systems for each sensitivity level is progressing under the leadership of Ruth Davis, director of the National Bureau of Standards' Institute for Computer Science.

In addition, a "Declaration of Consumer Rights to Privacy" for private businesses, soon to be completed by the Office of Consumer Affairs in the White House, would ask businesses to subscribe voluntarily to a code of fair information practices. This measure reflects the committee's feeling that the private sector should be asked for voluntary compliance before legislation is sought to require such compliance.

An executive order, now being circulated for final agency clearance, has been drafted to institute within federal agencies a new policy in collecting personal information. This would include a check-off box for individuals to use if they wished to prevent their names being sold for mailing list purposes.

A study of the privacy implications of electronic funds transfer and point-of-sale systems is also due soon from the Office of Telecommunications Policy.

Standards are being written by the Civil Service Commission for use of government employee's files.

An amendment to the Fair Credit Reporting Act that requires private credit data banks is being developed by the Office of Consumer Affairs. It would assure that a person be informed of any credit files on him, that he should have access to those files and have the right to challenge their accuracy.

In a case where a person was adversely affected by information found in such a file, the individual should be informed. Under the amendment, a person must authorize in writing the collection of any investigative data or sensitive medical data about himself.

With assistance from the Justice Department, an alternative to the existing criminal justice privacy bills has been drafted for introduction next year.

The bill would permit individuals to access their criminal history files. As for investigative files and intelligence files maintained by police, use of these would be confined to criminal justice agencies.

In other areas, the committee is working on specific regulations for restricting use of the Social Security number, a statute to assure confidentiality of data bases used for statistical and research work; an agency-sponsored study of the use made of records in hiring and promotions in the private sector; and a uniform and fair policy for government-initiated background checks.

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Inflation Clouds Firms' Brighter Financial Reports

By Molly Upton
Of the CW Staff

The year 1974 looked great at the outset for the computer industry, and even in May and June marketing managers were echoing the same line as in 1970-71 – "the slump won't affect us."

Financial reports revealed improved earnings and revenues over those of 1972 in most cases. But the real question, as yet unanswered, is: How much of those earnings are inflationary, and how much are real?

Toward the end of the year, it was again becoming evident that the data processing industry, although somewhat less sensitive than other industries, was not immune to the malaise affecting the general economy.

Although it was a time of record earnings for many firms, the price was high. Steep interest rates were cited repeatedly as nibbling away at what should have been earnings, as the scramble for cash occupied upper management's time.

Some members of the industry discovered that good business practices reap rewards, as firms focused on internal operations, tightening up accounts receivable and reducing the amount of cash tied up in inventory.

Hewlett-Packard, through improved fiscal management, appeared to be climbing out of the $114 million debt position it fell into during 1973.

Honeywell revealed declining margins in its computer operations, due to the high cost of sales and start-up costs for its new series.

Until the third quarter, Control Data Corp.'s (CDC) computer operations appeared to be the Cinderella and breadwinner of the company, changing roles with the previous provider, Commercial Credit Co., which was hard hit by interest rates. However, CDC then revealed that a joint development effort with a Swiss bank had taken it to the

(Continued on Page S/5)

Floppy Disks Booming Baby Of DP Industry

Although still in its product life infancy, the floppy disk drive has already left a legacy in the industry.

Firms that entered the race for the OEM market have discovered, if they didn't realize before, how long the lead time is between product announcement and generation of volume orders.

The necessity for cash is concomitant with the long waiting period.

Floppy disk drive production has also taught firms the value of mass manufacturing techniques, which although not new in other industries, was not always practiced in the DP area, where a plant's CPU production is not measured in thousands per month.

Floppy disk drive makers come in all sizes, showing a wide divergence in their dependence on the revenue-generating power of their product.

Control Data Corp., California Computer Products and Memorex Corp. have other larger products creating revenue to sustain operations until the mass market for floppies really opens up, which should be in '75 or '76, according to various estimates.

But other firms, some of which jumped into the floppy area sooner than the big companies, came armed with a single product, the floppy disk drive. These firms are liable to find the air somewhat colder until the market heats up.

Because they have to try harder, by virtue of their size and dependence on the floppy, some of the small firms are becoming noted for their engineering expertise and willingness to work extensively with their OEM customers in designing special interfaces, etc.

The larger firms generally are looking at the floppy business primarily as a high-volume, low-margin, standard product that will not incur such engineering expenses.

As in other markets in which IBM participates, the pressure is on to conform to IBM standards and design. During the past year, IBM switched to a ceramic head of very simple design. Now, most independents are offering the same type of head.

But it took time for head manufacturers and those firms that make their own heads to switch over to production of the ceramic units.

Memorex is still selling its non-IBM-compatible line of media and drives, but also has come out with some compatible materials.

Talk of shakeouts within the industry is commonplace, yet there is no agreement on which companies will disappear or drift into other areas of business, or when.

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Antitrust Tension High as IBM, U.S. Prepare Trial

By E. Drake Lundell Jr.
Of the CW Staff

Behind-the-scenes maneuvering marked the antitrust situation during 1974, setting the stage for major action during 1975.

The government's massive antitrust suit against IBM – the most important antitrust action for computer users and the industry alike – will get under way early in the new year, barring settlement, and the host of suits following on the Telex decision in 1973 would indicate increased activity in the coming year.

At the same time, a brand new name was added to the list of actors in the antitrust drama when the Justice Department formally charged AT&T with violations of the law. For years rumors have circulated about the possibility of such action.

While little was apparent on the surface – except for the constantly changing proposed trial dates – in the government vs. IBM case, all of 1974 was devoted to ironing out details in managing the trial and in outlining the positions of each side.

In the face of growing rumors about a possible out-of-court settlement, the Justice Department submitted its statement of triable issues and its preliminary trial brief to the court, giving a glimpse at the outline of the government's case against the industry giant.

But that was preparation for the trial that is now scheduled to begin on Feb. 18, 1975 – and what a trial it promises to be.

The case, both sides have admitted, could last as long as a year with sessions five days a week, week-in and week-out. In addition, the judge has indicated it might take him another year to sort all the information generated at the trial before making his final decision.

So, barring a settlement, 1975 promises to bring a lot of heat and on-stage action in the IBM case, but there is almost no hope for a decision during the year.

Rather, the decision may well not be made until late 1976 – almost nine years after the case originally was filed. And that estimate does not take into account any appeals to the decision, and whichever side loses is sure to appeal.

Therefore, computer users still face an uncertain future in which many of their plans could be upset by the action in court against IBM.

At the same time, the decision in the Telex case is still in appeal, with a decision expected at any time – and one that will almost certainly be made by the end of 1975.

The consequences of this decision, if it is upheld in favor of Telex, could be dramatic, because almost a dozen other pending cases make many of the same charges.

Inflation Clouds Financial Reports

(Continued from Page S/4)

deficit window with a $30.2 million pretax charge in the third quarter.

Expansion overseas continued at an even more rapid pace than previously, with smaller companies entering the international arena, primarily through representatives.

IBM, as usual, has seemed to keep the rest of the industry on its toes, changing the head on its floppy disk drive and inaugurating Synchronous Data Link Control, among other moves.

In the area of peripherals, Memorex seemed to revive with new financing and a new president and has developed controllers to interface its drives with the previously inaccessible DDA on IBM 370/125s.

Other than Storage Technology Corp., the competition in the peripherals area seemed to come from other mainframe makers themselves, rather than from the once prolific spawning ground of independent peripherals makers.

Univac now owns ISS, and Control Data Corp. publicized its peripherals efforts at the National Computer Conference by hanging its equipment on a 370 mainframe, instead of on a CDC unit.

Probably the hottest competition is in the minicomputer area, where price decreases sharply contrast with the increases levied by most mainframers.

Equally active is the race for survival in the minoperipherals area, which has seen giants such as Control Data devote exhibits at the Computer Caravan to such equipment.

In terms of the future, we're already seeing the same pattern emerge as in the 1970-71 slump: the computer industry lagging about six months behind the general economy in feeling the brunt of inflation.

This estimate indicates the brakes should be applied through midyear, at which point the general economy hopefully will be on the road to recovery.

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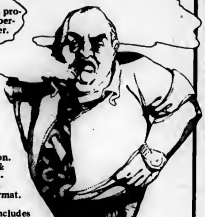

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IBM, AT&T Changes Affect Telecommunications Users

By Ronald A. Frank
Of the CW Staff

As might be expected, IBM and AT&T were the major news makers affecting the telecommunications user during the past year.

In the equipment area, IBM reinforced its commitment to dedicated applications for terminal users in two ways. The most obvious was first installations of its specialized terminals such as those designed for supermarkets.

Typically, the first systems ran in pilot stores and consumer reactions were important for both the vendors and the stores. These systems created a new level of user because the consumer gave his reactions to the store which in turn gave its reactions to the vendors.

Most of the dedicated terminal systems operated in local mode to a store controller, and on-line links to central DP sites were still in the future.

In a less obvious way, IBM firmed up its data communications software and network architecture with an announcement of its Systems Network Architecture (SNA). The concept included a common interface to interconnect terminal systems, front ends and new teleprocessing software into large data base 370s.

For most users, the SNA approach was still somewhat remote, especially since full Synchronous Data Link Control (SDLC) implementations of its Network Control Program (NCP) still awaited.

The overall IBM approach seemed to emphasize the autonomy of the dedicated terminal system at the remote site while retaining some enforced ties to the central DP site. Slower-speed terminals were upgraded with the introduction of the 3767 and 3770 general-purpose devices, but the SDLC/NCP combination still seemed aimed at the dedicated terminal user.

AT&T reacted more and more to competitors and the needs of users by offering additional, smaller LSI modems like the 202 series and 209 data sets; its DI conditioning indicated an awareness of data transmission problems although many critical parameters, like phase jitter, were still not officially recognized in Bell tariffs.

The high/low density private line rates took effect in June as a Bell counterattack on the specialized carriers. In addition, Watz rates were restructured in a way that seemed to limit the uses of high-volume data users.

Meanwhile, AT&T seemed to slowly bend on its hard-line interconnection policies. First, a connecting module was approved for phone answering devices, and some months later Bell informally mentioned that it might apply the same principle to answer-only data sets.

The specialized carriers gathered customers during the year, and many consolidated or combined their facilities to be more effective against Bell.

Southern Pacific and Data Transmission Co. (Datran) agreed to share facilities; MCI talked to Western Telecommunications, etc. First users of Datran's services began operating in Texas, but the firm was still far from its goal of a nationwide digital network.

The packet-switching carriers also pared their promises, and neither Telenet nor

(Continued on Page 5/8)

IBM Awaiting FCC Okay on Entry Into Domestic Satellite Service

The emergence of domestic satellite service somehow made it easier for the telecommunications user to grin and bear his terrestrial carriers during 1974.

After the Canadians had pioneered satellite service to limited areas in the U.S., Western Union literally got its first Westar satellite off the ground in the spring. Despite the warnings about propagation delays and other compatibility problems associated with the transmission of data via satellite, the first users had implemented airborne circuits by the end of the year.

The biggest advantage was price, with reductions over land facilities costs ranging up to about 40% on a typical voice-grade private circuit. There were still limitations, with service only to those areas within relatively short distances from earth stations. The missing link in widespread use of satellite service for users in rural areas was a low-cost rooftop antenna that could exclude the present dependency on the existing carriers for short links.

In July, IBM told the Federal Communications Commission (FCC) that it intended to buy majority interest in CML Satellite Corp., the company that had been founded by Comsat, Lockheed and MCI. Officially the proposal was simply a corporate merger, but industry observers saw IBM's entry as a bid for dominance of satellite-based telecommunications services in partnership with Comsat.

One of the major problems facing the FCC in its decision was that few companies in addition to IBM had the financial capability to enter the domestic satellite arena.

The commission clearly had a problem. In a field where it had fostered competition among the specialized carriers and in the interconnection of noncarrier equipment it was possible that IBM's competition might not be in the public interest.

In the fall AT&T decided that satellite competition posed a threat to its revenue and listed interconnection demands to cover its land-based facilities in the real (or imagined) harm that could be caused by indiscriminate interconnections with satellite services. The FCC rejected these demands, and users began to cautiously try satellite service, just as they had slowly switched to the specialized carriers several years before.

At year's end Western Union and American Satellite were ready to provide satellite links to users in a few cities. It was clear that the rates made satellite service cost-effective usually only for distances greater than 1,000 miles.

Despite all the pronounced advantages, the two carriers, both using Westar, offered essentially mirror images of land-based lines. The novel and innovative services apparently would have to wait until later. But teleprocessing users waited for a decision on IBM's entry.

The company spiked off things like digitized voice, and there were some who thought an IBM satellite service would be tied to its introduction of the computerized PBX, already available outside the U.S.

Regardless of the FCC's decision, it would still be several years before IBM could become an important force in the satellite carrier arena.

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Relations Between Users, Software Vendors Maturing

By Don Leavitt
Of the CW Staff

It was a generally quiet year regarding news about software packages and remote-computing services. There were few, if any, announcements of "breakthroughs" or products that would cure all the ills of the DP installation.

But there has been an underlying current of interest on the part of the user in what the vendors have to offer, an awareness on the part of the vendor of what the user needs – in contrast to what he could be sold – and continuing interest on the part of user management to make the DP function more effective, more efficient or both.

The net result of these growing pressures has been the decay and in some cases the complete disappearance of the "Not Invented Here" syndrome. Poorly estimated but generally high internal development costs and classic but all-too-real experiences with missing deadlines have combined with the growing reputations of various products and vendors to make acceptable the packaged route to implementation of an application or a support facility.

"Maturing" is as good a word as any to describe the attitudes and activities of both vendors and users this year. Perhaps the fifth anniversary of IBM's announcement of "unbundled" software and services prices, which passed – essentially unnoticed – this past summer, marked a real turning point for the DP community.

There has been news this year and some of it dramatic, for those concerned with business-oriented DP chores. The introduction of Cobol from various vendors for various minis has probably done more to make users interested in the possibilities of the small systems than all the equipment refinements made by the hardware vendors.

During the fall, Digital Equipment announced the availability of Cobol for the RSX-11 operating system on PDP-11s, updating an interpretive compiler system developed earlier for DEC's DOS by Computer Power Australia.

Meanwhile, independent software houses in this country have focused on other minis. The Integrated Business Oriented Language System (Ibols) from Diversified Data Systems, Tuscon, Ariz., has developed Cobol on Interdata's CPUs, apparently with Interdata's blessing. And the Call Co. in Florida said it has put a Cobol processor on Data General's Nova line of minis.

Meanwhile, operating systems for minis, for "small business systems" and for units such as the Sycor terminals (that started out as "intelligent terminals" but have evolved into stand-alone operations) have been updated and supplemented from various vendors.

Data General enhanced its RDOS to handle multiple terminals. Interdata added a multiprogramming version of the operating system for its 7/32 units. And DEC upgraded the RSX-11 for the PDP-11s that have become so important to the company and to the user community.

Bristol Information Systems, Fall River, Mass., has released generalized versions of various application packages it developed for the Datapoint 2200 terminals. R&S Advanced Systems, Santa Monica, Calif., has courted the Basic/Four users with a PL/I-type language processor.

Sycor released "Super" for some of its units, while Virtual Memory Systems of Orinda, Calif. focused on the DEC PDP-11 with its interleaving multiprogramming system called Score-11.

From two different corners of the world, theoretical constructs were discussed this year to aid in the transportability of programs from one mini to another. In England, "Unisym" – a universal assembler – was visualized under a grant from the National Computing Center with half a dozen U.S.-made minis among the 10 machines seen as target environments. From "down under," Computer Power Australia released details of Pogo, which it described as a high-level universal language for minis.

Centralization of Data Systems Continuing Despite Resistance

By Patrick Ward
Of the CW Staff

Consolidation of state governmental computer systems into one or more centralized data centers was a continuing trend in 1974, despite instances of user resistance and privacy concerns.

Kentucky reported it has saved $2.4 million/year since it began consolidating its DP operations onto a single large machine. Mississippi said its Central Data Processing Authority has saved it $500,000 annually.

However, centralization in Kentucky faced considerable opposition from user agencies that had their own machines, and in Louisiana the revenue department argued for and finally won its own machine after relying on a state consolidated computer center.

Arizona's governor opposed a DP consolidation bill because he felt it threatened the privacy rights of Arizona citizens.

The state senator who advocated the bill charged there was much tax money being wasted with the state's present DP arrangement. He blamed the governor's opposition on the superstition that " 'Big Brother' is going to take over if the computer is used in this manner."

And in Massachusetts, the Supreme Judicial Court ruled that a plan to consolidate all state government data processing was unconstitutional. The plan would have violated the doctrine of separation of powers, the court stated, since it would have called for a single data processing system to serve both the legislative and executive branches of government.

Despite such setbacks, "there is a definite trend among state governments toward centralized coordination and control, and in most instances . . . consolidation of hardware," observed Charles D. Trigg, associate director of the National Association of State Information Systems (Nasis).

Except in the smallest states, this will usually not mean consolidating a state government's entire computing power into one data center, Trigg said.

Larger states tend to set up functionally oriented data centers, he explained, with perhaps one center for human resources applications, one for criminal justice systems and a third for handling administrative, financial and revenue work.

Though the first aim of consolidation efforts has been to cut state DP costs, objectives are changing now that DP's role is changing, Trigg said.

The states first applied DP to their clerical tasks and then made it part of the day-to-day operations of many policemen and social workers, he explained.

"Now we are coming into the stage where DP is being used for management decisions and policy decisions," Trigg said. "It appears that using computers that way requires some coordination and centralization of a state's equipment.

"When you start using this data across agency lines for management purposes, privacy and security concerns enter the picture," Trigg said. "But management needs aggregate information, and not individual records for its decisions," he continued. Therefore, he concluded, the need for privacy and the desire for consolidation should eventually be able to coexist.

Labor Unions Lead Opposition to Automation

By E. Drake Lundell Jr.
Of the CW Staff

Automation and public policy has always been an issue with computer users, but it assumed new dimensions in 1974 and promises to become an even more important topic in the coming years.

In the past, the policy questions associated with installation of computer-based systems and the effect on the work force have been largely ignored or placed aside for future consideration. But labor pressure and other factors are forcing an immediate reappraisal of the situation, an appraisal that can no longer wait.

It is becoming increasingly clear that automation can in fact displace some segments of the work force, and even if automation does create more jobs than it displaces, that makes little difference to the worker who is displaced.

In New York City it was possible to displace many, if not all, typographers with computer typesetting equipment, leading the union affected to negotiate a contract that calls for lifetime pay for the workers displaced whose average age was 56.

In the automotive industry, the unions are taking a close look at proposed new systems to oppose those that will mean a net reduction of the work force without some other compensatory benefits to the workers. This opposition lead to a decision to install automatic welding equipment only in a new General Motors plant and not introduce it companywide in older plants where employees would have been displaced.

It appears that automation may even be cutting into the size of the clerical work force, although hard figures on this are not available.

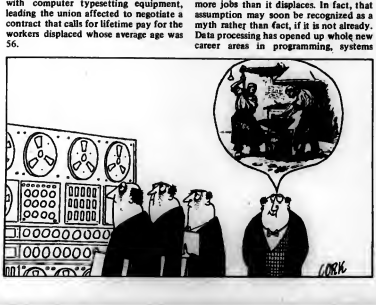
All of these examples raise interesting questions in a time of rising unemployment, those questions will increasingly demand attention at a policy level, rather than on an ad hoc basis.

The first major question attacks one of the long-held tenets of the data processing business, i.e., that automation creates more jobs than it displaces. In fact, that assumption may soon be recognized as a myth rather than fact, if it is not already. Data processing has opened up whole new career areas in programming, systems analysis and keypunching, for example, but perhaps these areas are or will soon become glutted.

As programming is taken out of the hands of programmers and placed more and more into the hands of the DP-educated end users, the number of programmers needed could slip, some say, perhaps in the next decade, as operating systems become more user-oriented. While user-oriented systems may well be an ideal goal, what would happen in the next decade, to the thousands of people educated essentially to be coders?

And even if automation does create jobs, it is not always easy and practical to retrain workers displaced by automation to handle the new jobs. Often the first workers to be cut by automation are those with the least education and ability to adapt to new circumstances, particularly if those new jobs require a higher level of education than the job held previously.

At the same time, proponents of automation point out that computer-based systems could free people from certain boring, dirty or dangerous tasks, which is certainly true. But the question that must be confronted is whether these gains for humanity in general are worth the individual catastrophes that could result.



IBM, AT&T Changes Affect Users

(Continued from Page S/6)

Packet Communications, Inc. was ready to begin service in the beginning of 1975, it promised.

A landmark of sorts was established when the Oklahoma regulatory commission said Southern Pacific (SP) could provide service to intrastate users. The big catch was that SP had to charge the same rates as Southwestern Bell.

The ruling seemed to ignore SP's claim that it could offer the service at one-third the price and still make money.

A Southern Pacific proposal in California for intrastate service remained stalled. But Pacific Telephone & Telegraph said it would offer an intrastate high/low tariff if SP got approval.

In the courts, MCI forced Bell companies to interconnect with specialized carriers, and the Justice Department filed its massive suit against AT&T. At the year's end, the legal pressures on AT&T raised the possibilities that the Bell System would be more responsive to users' needs, but only time would tell.

Minis in Business — Part 3

Media Exchange System Takes Load off Processor

By Theodore A. Franks
Special to Computerworld

Minicomputer systems have evolved to the point where users can custom design and program them to handle a variety of tasks that could otherwise tie up expensive mainframes.

An example is a media exchange system (input/output peripheral system) at Southern Bell Telephone Co. This system was initially intended to offload printing and card input tasks from several large host processing systems.

Two large Control Data Corp. train printers, a high-speed card reader, an ASR 33 console typewriter and three medium-speed magnetic tape stations comprise the peripheral complement. A Digital Equipment Corp. PDP-11/15 with 12K words of nonparity core memory was selected for the processor. Printer and card equipment selection was based on performance, reliability and cost.

Custom features were incorporated in the system design to insure maximum throughput. These unique features include:

- Statistical selection of type slug arrangement in the printer trains to allow a 61-printable-character set to operate at the speed of a 48-character train.
- Use of a read-only memory (ROM) in the card reader electronics to provide direct Hollerith-to-user code conversion.
- Use of phase-encoded magnetic tapes to increase packing density and insure maximum read/write reliability. The magnetic tapes also provide the interface link with the host systems.
- The host systems originally used 7-track, NRZ tapes. Until the host and media exchange systems were converted to phase-encoded recording, provision was made to handle both types.
- Direct memory access peripheral controllers were designed to minimize programming load and the rate of system interrupts.

The first expansion added capability to read "automatic message accounting" (AMA) paper tapes. These tapes are used in the telephone industry with certain types of central office equipment.

The format consists of 28 bit/frame and the readers feed at 30 frame/sec. Up to eight readers can operate simultaneously.

A fourth magnetic tape drive was added to collect the AMA data, and the memory was changed to a faster, larger version with parity control which was mandated by data integrity considerations.

The user noted that the PDP-11/15 could operate all peripheral devices simultaneously and still be only 30% busy. It was evident that there was considerable growth potential yet untapped.

A second expansion added card punching facilities. However, a basic limitation now became apparent. That is, the magnetic tape subsystem supported a maximum of four drives. Since a tape file was associated with each major peripheral, simultaneous operations were limited to the two printers, the AMA readers and either card reading or punching.

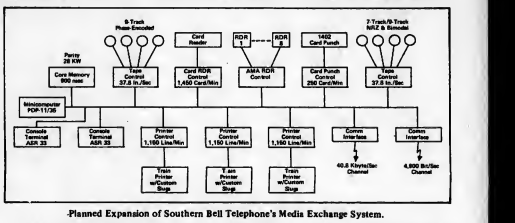
A third expansion is currently under way that will:

- Exchange the PDP-11/15 for an 11/35.
- Add another tape subsystem with four drives. Bimodal and 7-track NRZ operations will be supported.
- Add a third printer.
- Add two high-speed synchronous communications lines.
- Add a second console terminal to allow two operators to service the system.

Software for this system was written entirely by the end user. Two programmers with no previous PDP experience wrote the operating system and support packages for the initial system in about 12 man-months. The various expansions have kept one, or at times two, programmers busy for the past two years. Seven such systems are currently in operation.

Another example from the telephone company illustrates a large, multiprocessor system wherein the overall configuration and selection of peripherals perhaps best represents the effectiveness of minicomputer-based solutions.

Miniworld



Planned Expansion of Southern Bell Telephone's Media Exchange System.

The goals of this system were to provide for a transaction-oriented environment in which a large network of CRT terminals are interfaced to a massive data base for purposes of on-line order entry, logging, update, editing and output.

A previous system operated the network of terminals in batch mode, that is, order entry and logging during the daytime hours followed by batch runs at night to update, edit and prepare for output. Additional system requirements included:

- Built-in redundancies to allow fail-soft operations.
- Throughput increase of at least three to one.
- Provision for new applications such as administrative message switching, traffic recording and addition of random access facilities to the three host processors.

It is noteworthy that 10 of these systems are currently on-line and in total represented a substantial savings to the user as compared with an offering of equivalent capability from one of the large data processing manufacturers. The software was developed by the user and currently represents an investment of about 18 man-years.

Each processor in the system is assigned a functional task. The P1 and P2 11/45s provide the capability to edit, update and handle routine transaction processing. The disk processor 11/45 manages the disk and tape subsystems and provides overall system control.

The front-end processor 11/45 handles message assembly/disassembly and servicing of up to 120 communications lines. P1 additionally provides backup in the event of failure for the disk or front-end processors through bus reconfiguration switches.

Extensive use of dual controller connections facilitates fail-soft operations in spite of most hardware failures. The disk subsystem employs a special data transfer switch which can programmatically direct disk data to or from any of three processors (i.e., P1, P2 or disk processor). Hence, both programs and data can be directly transferred to the P1/P2 processor for execution as required.

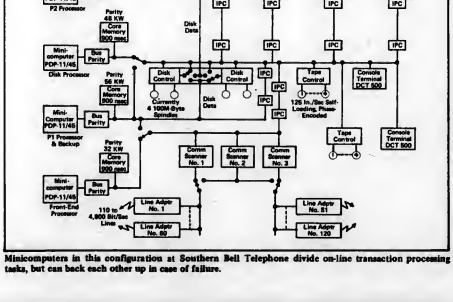
Up to 16 of the 3330 type disk drives can be attached.

Computer-to-computer channels, called interprocessor channels (IPC), allow direct memory-to-memory transfers between the P1, P2, front-end and the disk processors. IPC connections also link this computer complex to three host CPUs.

Dual magnetic tape controllers provide fail-soft tape operations such as journalizing, disk load/unload and tape media exchange with other processing systems.

The communications subsystem employs one scanner per 60 lines. Use of 120 lines requires two active scanners with a third serving as backup.

In Part 4, the author will discuss three other applications. Franks is a vice-president at Formation, Inc.



Minicomputers in this configuration at Southern Bell Telephone divide on-line transaction processing tasks, but can back each other up in case of failure.

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For Scheduling, Dispatching

CRTs Ease Dial-a-Ride Bus Service

Special to Computerworld

SAN JOSE, Calif. – Any application that calls for the dispatch and control of a large number of vehicles is a prime target for a dedicated CRT terminal-based minicomputer system, as the Santa Clara County Transit District recently discovered.

The county has launched what it claims to be the largest door-to-door mass transit system for its 1.2 million residents.

Three separate Four-Phase Systems IV/70 terminal systems, each handling a different area of the county, form the control center that coordinated 1,700 passenger trips in the first day of dial-a-ride service.

A total of 27 CRT terminals are used for scheduling and dispatching buses. The IV/70 systems handle data entry and provide operator control over all service functions. Fill-in-the-blanks display formats and automatic cursor control simplify operator procedures. Error messages additionally alert operators to incorrect entries such as misspelled street names.

How does the Arterial Personalized Transit (APT) system work? A resident calls for an APT "midibus" by telephone; a reservationist answers and enters the caller's name, address and destination through a CRT control console. The system locates the bus nearest to the caller's home and indicates how soon the bus can make a pickup.

After confirming the trip request with the caller, the reservationist transfers the data to a communicator at another CRT terminal by hitting an accept key on the scheduling terminal. The communicator reads the data from the dispatch screen and directs the bus driver to his pickup and destination points through a two-way radio. Pickup time can vary between 15 and 30 minutes.

The three IV/70 systems are installed in the dial-a-ride center at the county offices here and were used in simulated operations prior to last month's starting date for service. For the new service, 95 new midibuses joined the county's 105 regular buses to extend service to 97% of the county's population.

Calls for dial-a-ride bus service are handled by Santa Clara County reservation clerks using Four-Phase terminals.

County Project Director James T. Pott noted that no major problems were encountered during the first days of system operation. "The system performed beautifully and 80% of the pickups were made on time or within five minutes, either way, of the computer's estimated times," he said.

"Since most of the terminal operators in the program never used a CRT before," Pott noted, "it was imperative that all terminal functions be as simple to understand and operate as possible."

Following each pickup or delivery, the communicator hits a stop key which erases the previous pickup or delivery point from the dispatch display and brings up the next stop for the bus driver. Voice radio communication is used to inform the bus drivers of pickup and destination points.

Integrated Systems

Each of three computer-assisted areas of the county is under the control of a separate IV/70 for scheduling and dispatching up to 50 buses. Each system currently supports nine 1,152-character CRT terminals and is equipped with 72K bytes of memory, two 2.5M-byte disk drives and a 300 line/min printer to provide hard-copy printouts of each trip request for backup and transit management reports.

All three systems are integrated for total backup capability. If one system is out of service, its backup disk may be loaded on one of the other two systems so the second system can carry on the terminal functions for both control areas.

Eventually, intersystem communications will allow trip requests to be logged concurrently on two systems, eliminating the need for disk backup.

All three systems are linked to an uninterruptible power supply, another safeguard built into the system to maximize operational availability.

Each control area is monitored by a supervisor who controls the activity of all buses in the area with a supervisory CRT. The supervisor may also track and make changes to system constants, such as vehicle speed, as demand varies.

Custom software for the APT application was written for the county by LEX Systems, Inc. of Menlo Park, Calif. The present program, LEX/Dart III, provides control for up to 50 vehicles per system and requires only the Four-Phase processor for support.

To accommodate future growth, the LEX design enables the same Four-Phase systems to be operated on-line to the county's IBM 370/158.

Miniworld

Unit Allows Connection Of Most Card Readers

LIVERMORE, Calif. – The CRC-8E universal card reader controller from Applied Peripheral Systems, Inc. is compatible with the Digital Equipment Corp. PDP-8/E minicomputer and allows attachment of most TTL-compatible mark-sense and punched card readers, the vendor said.

The CRC-8E costs $850 from the firm at 1781 Barcelona St., 94550.

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Special to Computerworld

ATLANTA – The ability to implement Cobol on a minicomputer is allowing one user here to realize significant savings while easing the conversion of new applications.

The user is Video Type, Inc., a specialized service bureau providing a range of text processing and electronic type composition services. According to Paul Baker, president of Video Type, the company's systems fall into two categories: specialized composition systems and more conventional file maintenance and business applications. "Cobol is valuable in both areas," Baker said.

"The real significance of this for us is that we have a good Cobol compiler which can compile and execute in a multiprogramming and on-line environment on a $160,000 computer. Before, we would have had to go to a much larger system for this kind of capability, and we would have a hard time affording such a system."

Video Type uses Digital Equipment Corp. (DEC) PDP-11 and CRT photocomposition equipment to produce fully composed pages of type for insurance rate books, railroad tariff publications, state statutes, law books, catalogs, credit card bulletins and a variety of business directories. Imminently, Video Type plans to use PDP-11 Cobol for other business needs, including a payroll and job costing application for a large printing firm.

The 144K-byte PDP-11/45 system cost $160,000 and includes disk and tape subsystems, line printer and terminals. Software includes an assembler language used in developing composition programs, a typeset composition program and Cobol. All of these capabilities operate concurrently under a common operating system.

For some of the typeset applications, data is transmitted from remote sites using PDP-11/05 minicomputers as terminal controllers. These remote locations are polled by the central PDP-11/45 system, and data is transmitted over voice-grade telephone lines for processing on the central system. Merle Knotts, systems analyst who was responsible for the design and programming of the on-line system, said, "These operations were previously handled by IBM 1130s, but the PDP-11/45 is superior in terms of cost/performance.

"Cobol offers us several significant advantages," Knotts commented. "The Ansi '74 Cobol provides a business language that is compatible with other machinery. This means a Cobol program written for the PDP-11/45 will operate on any other computer supporting industry-standard Cobol.

"This compatibility means we can purchase programs from other sources and save the cost of writing our own standard applications. Further, it is easier to find programmers that are already trained in Cobol."

One interesting application of DEC's Cobol is in the maintenance and processing of data files used to produce weekly TV schedules for 35 newspapers in the South.

"One of the first jobs taken over by the new Cobol capability is file maintenance for some of the large data bases needed for text preparation," programmer Bob Elliott stated. "For example, we process files containing TV program listings and produce schedules for newspapers. We then use a sort utility to sequence the listings according to channels and times for each individual newspaper. This output is compatible with the composition system so that type can be produced quickly.

"The inspect statement is another useful capability in editing text for input. String and unstring are useful in the manipulation of data within a given program. The tape handling and subscript capabilities also save programmers a significant amount of time in writing programs," he said.

Paul Baker and Merle Knotts review camera-ready copy of TV schedules.

Miniworld

Nova Interfaced to Univac CPUs...

SAN PEDRO, Calif. – Data General Nova users can obtain interfaces for Univac equipment and General Electric's Terminet from Command Control and Communications Corp.

The Univac interface board allows the Nova to simulate the I/O of Univac 30- and 32-bit computers. The Nova can thus serve as a preprocessor or multiplexer for the Univac machines, or it can drive Univac peripherals on its own.

The company noted that for some special-purpose equipment there are interfaces for the Nova, but not for Univac equipment.

In these cases, the Univac user could set up a Nova as an intelligent controller for the device, the firm said.

The Nova/Univac interface costs $4,000.

Command, Control and Communications has also announced an interface that allows Nova users to utilize the 120 char./sec GE Terminet.

The Data General user can either mail his existing teletypewriter board to the company for modifications or buy one for $500. The firm can be reached at P.O. Box 242, 90731.

...And Inforex 180 Line/Min Printer

BURLINGTON, Mass. – A 180 line/min nonimpact printer with an interface board for Data General Nova minicomputers is now available from Inforex. The device was formerly manufactured by Data Interface, Inc.

The Model 180 is a dry-ink transfer device that can print lines of either 80 or 132 characters using a standard 96-character set.

The printer has a 10 by 12 dot matrix available in multiple fonts of either upper-case or upper/lower-case, Inforex noted.

It requires ordinary 8-1/2-in.-wide bond paper in either roll or fanfold packaging and needs an inexpensive toner, the vendor said.

While the unit takes up less space than a conventional typewriter, it can produce fine-line graphing, curve plotting and bar charting functions and can operate at up to 2,400 bit/sec, the firm stated.

Inforex recently acquired Data Interface, which had been supplying it with the printer.

The device costs under $3,000 from 21 North Ave., 01830.

Arithmetic Board Plugs Into Nova

AUSTIN, Texas – Unitech's Model 279-0 multiply/divide/shift unit is compatible with Data General Nova 2 minicomputers and can multiply in 5.5 μsec, divide in 5.8 μsec and perform 13 shift operations in 2.2 to 8.5 μsec (single and double accumulator, zero to 31 bit positions), according to the vendor.

The unit is packaged on a standard 15 in. by 15 in. board that plugs directly into slot two of the Nova 2, Unitech said. There are two options available at $100 each: "signed multiply" for performing two's complement multiplication in 5.5 μsec (thereby eliminating software sign correction); and a "high-speed" option that cuts execution time to 44 μsec for signed and unsigned multiplication and division and to 2.2 to 5.5 μsec for shifts.

The Model 279-0 costs $1,400 from the firm at 1005 E. St. Elmo Road, 78745.

Disk Drives Replace Cartridges

REDWOOD CITY, Calif. – Two disk pack drives from Ampex Corp. can each replace several cartridge disk units, providing lower price per bit storage costs, according to the firm.

Ampex's DM-940 single-density module can provide 40M bytes of storage, and the double-density DM-980 can provide 80M bytes. Both use a five-high removable disk pack similar to the Control Data 9876 and 9877 models, Ampex spokesmen said.

The devices will be able to interface most minicomputers and medium-sized computer systems, the spokesman said.

The DM-940 will be available in the third quarter of 1975 for slightly over $5,000 and the DM-980 will cost about $6,500 from the firm at 401 Broadway, 94063.

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People Problems Seen Viable Contract Escape Clause

QUEBEC CITY – Computer users in industries such as retailing should be able to cancel contracts for human reasons, such as if operators or the public cannot adapt, according to David J. Toomey, a New York attorney.

Speaking at a recent retailers' DP conference here, Toomey suggested that the reticence of clerks to learn how to operate point-of-sale terminals or a negative reaction from the public should enable retailers to cancel contracts for such equipment, possibly with cancellation penalties.

Litigation Best

When major differences arise between users and suppliers, Toomey said he advocates litigation rather than arbitration "if all else fails."

The chief reason for this is the uncertainty of the outcome of arbitration, the inability to appeal that outcome and the fact that "rules of evidence" do not apply to arbitration.

"A well-drafted contract supports you in litigation," he noted, adding "look at your chances of winning" before filing a lawsuit.

Define 'Acceptance'

A user on the panel cautioned his colleagues in the audience to define the term "acceptance" as it applies to the delivery of a computer system and its ability to perform.

Lewis S. Reff, senior attorney with the J.C. Penney Co., called for full definition of "acceptance" under the Uniform Commercial Code so that the acceptance of the computer onsite could not be construed as acceptance of its ability to function within contract terms.

He also said maintenance and warranties present danger points for all users to consider in the contract negotiation process.

The "criterion for acceptance" should be outlined in the warranty section of a contract and not in the computer specifications, Reff stated.

The warranty section normally includes manufacturers' disclaimers which must be thoroughly evaluated, he said, adding that the term "good operating condition" – the stage at which "acceptance" often takes effect – must also be defined.

'Be Suspicious'

Reff advised users to sign up for maintenance when they purchase computers rather than at the expiration of a warranty. He also suggested users "be suspicious" of a manufacturer who also sells maintenance.

When maintenance is performed within the warranty period, this work may itself carry no warranty, he cautioned. If, for example, such repair work is done the day before a warranty expires, it may carry no guarantee that any possible problems created by, or not solved by, the repairman will be covered free of charge.

Reff said users could help their investment tax situation by putting a year's paid maintenance into a system's purchase price but warned local property tax laws could negate any such benefit.

Some tax jurisdictions, he explained, impose a tax on full systems, including software and possibly maintenance.

DP Error Costly For Theft Victim

DENVER – A data entry error and different stolen motor vehicle identification procedures between Denver police and the State Patrol resulted in a $500 adventure here for the victim of an auto theft.

When Patrick Cavanaugh discovered his car had been stolen he notified Denver police, who entered the wrong license plate number and correct vehicle identification number into the National Crime Information Center (NCIC).

Not Stolen?

A state patrolman found the car in a lot in Flagler and according to procedure checked only the license plate number, which was cleared by the computer system as not belonging to a stolen vehicle.

Two and a half months had elapsed before matters were finally corrected and Cavanaugh was notified his car had been found.

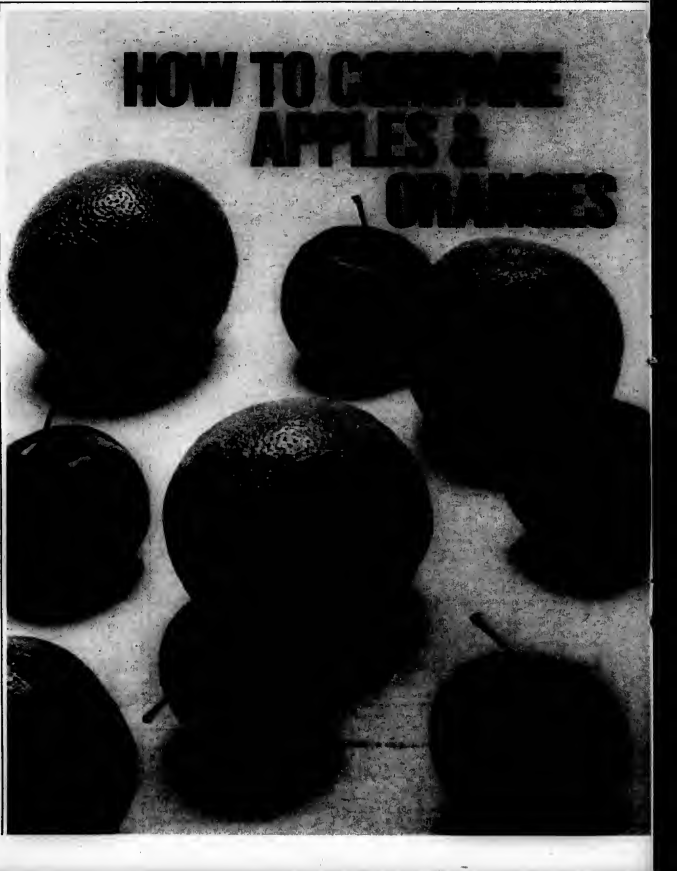
Meanwhile, Cavanaugh bought another car, which was also stolen, and a third car to replace the first two. By the time he had his original car back, he was $511 poorer and the owner of three cars.

Rural Ind. Community Abandons Bus System For Lack of Specificity

LAFAYETTE, Ind. – Computerized routing may not be the best solution to busing in rural communities.

Because of difficulties in pinpointing the rural addresses needed to compile routes, transportation officials with the Tippecanoe School Corp. (TSC) canceled an agreement with Educational Coordinates to computerize busing here, a TSC spokeswoman said.

"The system might have worked, but we never had a chance to try it because we couldn't provide the system with enough of the necessary information," she explained. "The addresses we had for children just weren't specific enough."



Hand-Held Terminals Help Spark D.C. Automobile Inspection Lane

WASHINGTON, D.C. – Would you trust a computer or an auto repairman to evaluate your car?

Betting that some people would prefer a machine, the District of Columbia has set up a computerized auto inspection lane to see if it will prove a convenient means for the car owner to check on the safety and efficiency of his vehicle.

A prime advantage of the computerized system is that it doesn't skip inspection steps, noted a spokesman for Avco Systems Division, which developed the inspection system under contract to the Department of Transportation/National Highway Traffic Safety Administration. Four other states are planning to try the system, the Avco spokesman noted.

Takes Control

When a car comes into the inspection lane, an attendant enters the car model and year into the minicomputer-based system, which then takes control of the inspection sequence. Lane attendants enter inspection data through hand-held terminals. A battery of devices, some of which read directly into the computer, test engine efficiency, front-end alignment, exhaust emissions and brakes.

Lane attendant enters inspection data through hand-held terminal.

The system then compares the input with criteria set for that car model and prints out a report on the car's condition.

Course Helps Small Investor Plan Finances

NEWTON, Mass. – Small investors interested in boning up on better ways to manage their money may be interested in a computerized correspondence course in personal financial planning developed by a software firm here.

Designed by Responsive Communications, Inc. (RCI), the six-lesson course is geared toward helping the small depositor/investor who cannot afford services of a private financial counselor.

Each lesson covers a separate subject such as wills and trusts, taxes, insurance or retirement planning. The investor taking the course receives a specially prepared booklet covering each of the subject areas as well as an optional personalized financial analysis, performed by computer, after the sixth lesson.

While the course is being made available through banks as part of a public relations effort, RCI does all scoring and processing of the weekly quizzes on a time-sharing IBM 370 system using a Mohawk System 2400 as an intelligent terminal.

The computer scores each quiz, records the results in the student's file and prints out a letter explaining right and wrong answers.

At the conclusion of the course, each student is invited to complete a rather extensive financial questionnaire. The computer analyzes the information provided and prints out an 18 to 20 page report of that individual's financial picture at various stages of his life.

Once a person has completed the course he is in a better position to intelligently discuss personal financial planning with an attorney, insurance agent, investment counselor or bank trust officer, according to the firm.

Fee for the course ranges from $25 to $40. It is available through Continental Illinois National Bank and Trust Co. of Chicago and Old Colony Trust, a division of the First National Bank of Boston.

The course will also be available through banks in Cleveland, Denver, Philadelphia and Detroit after the first of the year, according to RCI.

RCI is located at 430 Lexington St., 02166.

Ear Defects Studied

LOS ANGELES, Calif. – A scientist here is developing a series of mathematical models to describe the workings of the inner ear to learn more about hearing defects.

The mathematical models, developed by Dr. Alfred Inselberg of IBM's Scientific Center, describe the function of the cochlea, the snail-shaped organ that contains the receptor cells of the brain's auditory nerve.

Scientists at the Ear Research Institute of Los Angeles will use the models and an IBM 370/145 to study Meniere's disease, whose symptoms are dizziness, nausea and a ringing or buzzing noise in the ear.

The research project also is providing clues to the causes of presbycusis, the diminishing ability to discern high-pitched sounds as a person gets older.

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COMPUTER INDUSTRY

CI Notes

Calcomp vs. IBM Separated

SAN FRANCISCO – Federal Judge Ray McNichols has ordered a separate trial of California Computer Products, Inc.'s (Calcomp) antitrust suit against IBM.

He also established a September 1975 date for the combined trial of Hudson General Corp., Transamerica Computer Corp. and Marshall Industries vs. IBM, indicating the trial of Calcomp vs. IBM would most likely follow. He did not set a date for the Memorex, DPF, Inc. and Forros Precision, Inc. suits against IBM.

All seven of these suits are assigned to McNichols for coordination of pretrial discovery.

Calcomp's counsel suggested that IBM probably has a document retrieval system that will greatly speed up document search and presentation in these cases. The judge said this subject will be explored thoroughly at the next hearing, set for Jan. 24 in Boise, Idaho.

Report Sets T/S Revenues Over $1 Billion

NEW CANAAN, Conn. – Revenues from time-sharing in 1974 topped the $1 billion mark for the first time, according to a study by International Resource Development. The market should double within five years, the report added.

New satellite channels, competition from specialized common carriers and the emergence of the value-added networks should reduce the percentage of time-sharing revenues spent on telecommunications, the study said.

Control Data Corp. is the leading supplier of remote computing services, followed by General Electric, according to the study.

DP Grows in Trucking Industry

WASHINGTON, D.C. – The percentage of large American truckers operating their own DP equipment has risen from 10% to over 50%, since 1967, according to the initial results of a survey being conducted by the management systems committee of the American Trucking Associations.

Many other such carriers use service bureaus.

"The day when motor carrier computers will automatically answer routine, shipment-related messages from shipper computers will be upon us sooner than we now may think," predicted William G. Mitchess, chairman of the committee.

Burroughs Seeks Facsimile Maker

DETROIT – Burroughs Corp. has agreed to acquire Graphic Sciences, Inc., maker of "dex" telecopiers for about 375,000 of its shares.

The agreement is subject to approval by both boards of directors and Graphic Sciences shareholders.

Adapso Salary Survey

Software Firms Rate High on Pay Scale

By Molly Upton
Of the CW Staff

MONTVALE, N.J. – The 1974 Wage and Salary Survey by the Association of Data Processing Service Organizations (Adapso) illustrates that software firms pay higher salaries than data centers and time-sharing firms in seven out of 13 selected classifications.

This may be due to several factors, according to the report. Location and size of firm play significant roles in determining salary levels. For instance, for five of the 13 positions, firms in the Northeast generally pay higher salaries than those in the North Central, South and West.

In addition, in every selected position, firms with revenues over $3 million paid better than smaller firms, although the range in salaries varied greatly.

The survey, compiled from responses from 285 companies, lists about 55 salary positions and compares salaries from the four major sectors of the industry: data center, time-sharing, software and facilities management firms.

Computerworld looked at 13 positions in the operations, programming and systems analysis areas. The full report is available for $20 from Adapso at 210 Summit Ave, 07645.

Software Pays Well

Software firms paid higher salaries than the other types of firms in the top two positions in the categories of computer operations, systems analysis and programming.

Among software firms responding, the job of supervisor/manager of computer room received an average of $306/week, about $35 above the average salaries for the same position in both data centers and time-sharing installations as well as the industry average.

The position of shift supervisor/senior operator paid $268/week among software firms, about $47 more than the average for all types of firms responding to the questionnaire.

But among the upper half of operators, time-sharing firms averaged the highest salary, almost $185, and software firms the lowest, $149. The overall industry average for this slot was $168.

In the systems analysis categories, manager, supervisor/vice-president received an average of $447 at software firms whereas the industry average was $406, brought down by the low of $382 at data centers.

A lead systems analyst job at software firms averaged $404 compared with the industry average of $365. Again data centers averaged the lowest amount, $331.

(Continued on Page 25)

CIA Calls for Explicit Limits On 1 Company's Market Share

By Edith Holmes
Of the CW Staff

CHICAGO – Proposals advanced here recently by the president of the Computer Industry Association (CIA) would revise the Sherman Antitrust Law enacted in 1890 to meet "the phenomenal changes in our industrial organization over the last 100 years" and particularly those in the computer industry.

Speaking before the Executives Club of Chicago, CIA head Dan L. McGurk suggested Congress establish an explicitly stated limit on just how much control one company can maintain over any single marketplace, tax credits for monopolies that break themselves up voluntarily and a graduated income tax on corporate profits above $100 million.

McGurk who also made his proposals to the Senate subcommittee on antitrust and monopoly in reference to both AT&T and IBM, termed them "embryonic suggestions" of the sort needed "if we are going to return to a real free enterprise system rather than continue on our present course of greater and greater concentration of power, imperfect market mechanisms and the inevitability of greater and greater direct government intervention through regulation of our economic system.

"Except for some patchwork additions promoted by special interests, the rules of the game have not been reviewed for too long a time," he said. Charging that these rules no longer define today's economic game, McGurk contended they must be "reexamined and changed if we are to regain a vigorously competitive capitalist system."

"Every businessman has as his objective to be a monopoly in his marketplace – that is fundamental to our free enterprise, profit-motivated, American system." But, he added, "the problem is what, if anything, should be done when someone is too successful?"

In an effort to determine "how much is too much," McGurk asserted that no one industrial entity should control all productive resources any more than they should be controlled by one socialist state.

He compared free competition and oligopoly, or shared monopoly, with two kinds of sailboat racing – one in which many boats take part and match races between two boats.

"In both cases the condition of the boats is important, as well as the seamanship of skipper and crew," he remarked.

"But the best strategy for an open race is to attempt to reach the finish line in

Yugoslavian Users Show Interest In U.S. Developed Software

By a CW Staff Writer

ZAGREB, Yugoslavia – Yugoslavian computer users are extremely interested in U.S. software packages, particularly in the engineering and scientific fields, according to E. Drake Lundell Jr., editor of *Computerworld*.

At the same time, there is also a great deal of new interest in the area of U.S.-made data entry and output devices, according to Lundell, who served as the industry technical representative at a Commerce Department-sponsored exhibit during the recent Interbiro congress here.

Most of the mainframe equipment in Yugoslavia is U.S.-made, Lundell noted, adding that all of the major U.S. mainframe companies have strong marketing operations in Yugoslavia.

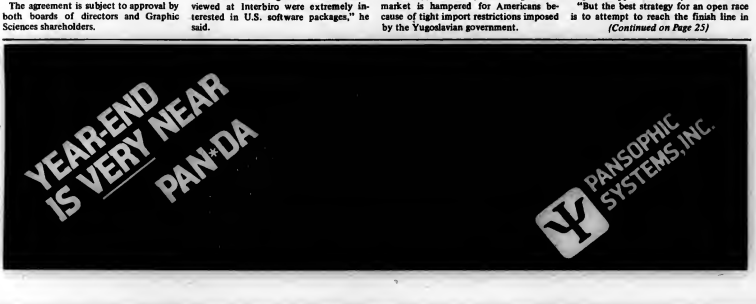
"Most of the Yugoslavian users interviewed at Interbiro were extremely interested in U.S. software packages," he said.

"They recognize that software packages will help them shorten development efforts needed to get systems up and running," he said, adding, "at the same time there is a shortage of trained personnel to do software development in Yugoslavia, therefore making U.S. software even more attractive."

Particular emphasis, he said, is in the areas of scientific, engineering and industrial control applications, even though there is a growing interest in some commercial applications, notably in the fields of banking and insurance.

In addition, Lundell said Yugoslavian users are just beginning to move away from card-oriented data entry to newer forms such as key-to-disk systems, which should be a growing market segment.

Presently, however, the Yugoslavian market is hampered for Americans because of tight import restrictions imposed by the Yugoslavian government.



Software Firms Rate High in Adapso Salary Survey

(Continued from Page 24)

But for the lower half of the system analyst scale, time-sharing firms paid a high of $294 compared with the industry average of $265.

Programmer's Pay

In the programming area, manager, supervisor/vice-president was paid a high average of $469/week by software houses and a low of $357 at data centers. The industry averaged $412 for this job.

Lead programmer/project manager averaged $391 from software firms and $300 from data centers; the overall average was $350.

Time-sharing firms averaged a high salary of $347 for a senior programmer compared with $310 across the industry.

The narrowest spread of average pay for any position among the three segments of the industry occurred at the lower half of the programmer rung, with time-sharing having a slight edge at $227. The average was $223.

Programmer trainees were paid quite a bit higher by the software houses, at $198, compared with the industry average of $181.

Of the 13 positions selected for illustration here from the 55 contained in the report, the Northeast was noted for the highest average pay in five positions: data capture and unit records supervisors, the two top slots in systems analysis and lead programmer/project manager.

Data capture supervisors averaged $192 in the Northeast; the industry average was $186. Unit record supervisors generally were paid $322 in the Northeast, vs. $255 average.

In the North Central area of the country, pay was highest for the upper tier of operator and in the programming area, manager, supervisor/vice-president. The survey showed the south paid top dollar for programmer trainees, $210/week, and for the lower rung of systems analysts, $330, as well as for shift supervisor/senior operator, $230.

Western firms usually paid more for supervisor/manager of computer room, $283, and for senior programmer, $320.

In some instances there were significant differences in the range of salaries between companies with revenues under $500,000 through the fourth category, those over $3 million.

The manager, supervisor/vice-president level for programming varied as much as $150 among the average salaries, from $296 for smaller firms to $456 to the largest.

The lead programmer/project manager pay varied by $120 from $270 to $315.

Another category with a wide spread was unit record supervisor, which ranged from $151 at small firms to $271 at very large companies.

But for senior programmers, the difference was only $20 between small and large firms: from $295 to $315. There was a $30 spread for top operators, from $152 to $182.

CIA Seeks Limit On Market Share

(Continued from Page 24)

the minimum possible time, taking advantage of winds, tides and the tactical position of other boats," McGurk explained. By contrast, "in a match race, one has to track the other boat very carefully.

"If [one boat is] in front, it is unwise to let the other boat go off by itself; the competitor must be covered at every turn," he said. "If behind, it is the most cautious route to follow the leader and attempt to best him in seamanship and tactics.

"Total time for the race, or the overall efficiency in reaching the finish line, is irrelevant. The two match race boats tack essentially the same course," McGurk added.

McGurk urged Congress, in rewriting the Sherman Act, to precisely define monopoly as having some percentage, like 30% or more, of a market of national importance for a reasonable period of time.

"The goal here is to make sure that the competitive race is an open one and not a match race where the leader determines the course," he said.

In addition to asking Congress to declare market concentration "directly and definitely illegal," McGurk suggested that the energy expended by management to maintain and expand market share be redirected through tax credits awarded for keeping markets competitive.

"For example, he said, "a corporation divesting itself of an operating, viable entity by distributing shares to its shareholders and completely separating itself from the new corporation could be granted a tax credit of something like 5% of the audited value of the divested assets for a period of 10 years."

To pay for this restructuring tax credit and to redress the economic balance in favor of smaller units or companies, McGurk proposed a graduated corporate income tax.

"Over $100 million of pretax profit might be subjected to a surcharge of, say, 5% and over $1 billion of pretax earnings to a 10% surcharge," he said.

"Such a graduated tax would give stockholders an opportunity to evaluate whether there were real efficiencies of scale or whether management was directing the affairs of the corporation for its benefit rather than that of the stockholders," McGurk added.

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All participants in this seminar will receive a 2-volume loose leaf outline of all course materials (prepared by ICC Institute), a copy of "Data Modems Selection and Evaluation Guide" by Vess V. Vilips and a "Data Communications and Teleprocessing Dictionary."

You should attend this seminar if you are currently involved in data communications on a management or operational level and wish to expand your knowledge of the field – or if your company will be going into this area in the near future.

This seminar runs two days, and total cost, including workbook, reference materials, luncheons and continental breakfasts is $350. Additional registrants from the same company qualify for a reduced rate of $300. Current schedule is as follows:

Los Angeles	Los Angeles Marriott (Airport)	January 13-14
New York	St. Moritz	February 10-11
Chicago	Hyatt Regency O'Hare	June 2-3
Washington, D.C.	Stouffers National Center Inn	June 9-10
Orlando	Travelodge at Lake Buena Vista	July 2-3

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- *the development of a full-service analysis and system design.*
- *optimum file organization and indexing techniques.*
- *all available indexing techniques and their implementation.*
- *all aspects of system management.* • *and much more.*

One of the key features of this course is the workshops, in which you'll apply what you've learned. And before you're finished you'll have "done" a complete, on-line order entry / inventory management system.

You should attend this seminar if you are (or will be) involved in the design and implementation of a data base system – whether as a DP Manager, Data Base Administrator, Planner, Analyst or Programmer.

This course runs for 3 days, and costs $350, including course materials, continental breakfasts and luncheons. Additional registrants from the same company qualify for a reduced rate of $300. Current schedule:

Boston	Sheraton Boston Hotel	February 10-12
Los Angeles	Los Angeles Marriott	March 3-5
Chicago	Sheraton O'Hare Motor Hotel	May 12-14
New York	The Plaza	June 2-4

Contracting for Computers and EDP Support Services

A seminar that can help you protect your EDP investment – and your system.

In an industry that's famous for its "promise them anything" attitude, you need good, effective contracts from the vendors that supply your installation. And that seminar gives you the information you need to get them. It will show you how to protect your installation from late deliveries, inadequate equipment or services and the costly disruptions that they can cause.

Course topics include the lease and purchase of computer systems, separate hardware and software – the purchase of time sharing, data processing services and consultation – and the use of facilities management.

Under the personal instruction of Roy N. Freed, a nationally known lawyer, author and expert in the field of computer law, you'll learn how to place yourself in a strong bargaining position, how to insure on time delivery of exactly what you want, how to set reasonable performance standards for warranties – and much more. You'll also receive a complete resource notebook, including sample vendor contract forms.

You should attend this seminar if you are involved in the purchase of EDP equipment or services, whether as a corporate counsel, contract administrator, DP manager, consultant or officer of a using firm.

Cost for the entire 2½ day seminar, including complete resource notebook, continental breakfasts, luncheons and coffee breaks is $295.00. The current schedule:

Los Angeles	Los Angeles Marriott	January 15-17
Chicago	Hyatt Regency O'Hare	February 26-28
Atlanta	Stouffers Atlanta Inn	April 23-25
New York	St. Moritz	June 4-6

Operating Systems and Virtual Storage

A seminar on more efficient operation of your computer system.

Large installations now expect many programs to run simultaneously and efficiently. And that's what this 2½-day seminar is all about. Under the leadership of Dr. Ivan Flores, author of 14 books and one of the world's most prolific writers on systems software, you'll gain an excellent technical knowledge of your operating system, OS and VOS. The course uses the IBM/370 as its subject computer, because of its popularity, and includes these topics:

- Overview of Operating Systems
- Hardware aspects of Operating Systems
- Job Management
- Task Management
- Data Management
- Virtual System Philosophy
- Virtual Hardware
- Virtual Storage Operating Systems

Everyone involved with operating systems can benefit from this seminar. Programmers can employ its lesser known features. The manager can choose an operating system and options to handle his installation more efficiently. The chief operator can understand what's happening and better manipulate the system. The executive can determine the requirements for his plant.

Cost for the entire seminar, including course materials, luncheons and continental breakfasts is only $295. Current schedule:

New York		February 3-5
	St. Moritz Hotel	

Key-to-Storage Systems

How to evaluate and optimize the various successors to keypunch equipment.

Data entry is a big problem – and a big headache – as every computer user knows. It is there fore a prime target for cost savings. This course is designed to help you in the practical aspects of selecting, installing, and making the best use of keyboard to storage systems. It is an expansion and an update of our successful key disk seminar. Under discussion (including some user case studies) will be:

- Introduction to data entry concepts (keypunch, buffered keypunch, keypunch, key disk and beyond)
- Key disk hardware and software
- Evaluating and starting key disk systems
- Selecting and operating intelligent terminals, both key to cassette and key to floppy disk
- Key disk as a remote batch terminal
- Supervisor functions, motivation
- Mixed Media systems
- Trends in Computer Data Entry

This seminar is led by Lawrence Feidelman, President of Management Information Corporation, and one of America's leading experts on data entry. All participants will receive a copy of "Data Entry Today". Management Information Corporation's authoritative publication on every aspect of data entry, including a six month update of this continuing reference service.

You should attend this seminar if you are concerned with optimization of your data entry shop, and especially if you are considering or currently using key-to-storage systems more advanced than basic keypunch. Cost for the 3-day seminar is $350, including continental breakfasts, luncheons, and all course materials. Additional registrants from the same company are charged only $300.

Los Angeles	Sheraton Inn (Airport)	February 3-5
New York	Waldorf Astoria	April 21-23
Chicago	Hyatt Regency O'Hare	June 9-11

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TRW to Begin National File On Business Credit Information

CLEVELAND – TRW, Inc. will develop and operate a national business credit information system in cooperation with the National Association of Credit Management (NACM).

The National Credit Information File will enable more than 38,500 NACM member firms to obtain trade credit information on businesses in the 50 states. Data on two million firms will be available when the system begins in March 1976, an NACM spokesman estimated.

"Collection of data is our major task," said Jim Woods, a liaison man between TRW and the NACM. One solution is to enroll Fortune 1000 companies with automated accounts receivable systems, Woods mentioned. These firms would contribute ledger information on their customers to the business credit file.

A firm's credit rating will be updated at least every 90 days. It will contain information on open credit accounts, date of last sale, payment terms, recent high credit, amount currently owing and past-due amounts in 30-, 60- and 90-day categories, TRW said.

There will also be six-month totals of payment trends to indicate how the subject of a report has met its credit obligations, TRW noted.

NACM member firms will be able to make inquiries either through teletypewriters or by contacting their local NACM branch office.

Woods said a company listed in the file would have the right to inspect and seek to change data about it.

Lloyds to Expand Cash Net

LONDON – Lloyds Bank here plans to extend its computerized cash dispensing network by offering to install on-line computer terminal dispensers in stores, offices, factories, hospitals and universities.

It also plans to develop a "credit point" system to permit account holders to make deposits, transfer funds or obtain account statements through remote computer terminals.

The cash and credit point systems are part of expanded coverage and facilities of the bank's cash and credit network costing almost $13 million for IBM terminal equipment.

Lloyds has also ordered 100 IBM consumer transaction terminals for delivery in 1976. These will permit account holders to perform a greater variety of banking functions apart from the bank's branches during nonbanking hours.

Orders & Installations

Brockton (Mass.) Public Schools has ordered a Univac 9480 system for installation early next year in Brockton High School. The primary application will be student scheduling.

Greenman Brothers, Inc. has installed the first Memorex 3673 disk controller to the System 370/125 Direct Disk attachment and attached three Memorex 3670 spindles to the 370/125.

Overly Manufacturing Co. has ordered a Spur Products Corp. controller to link an IBM printer with a Digital Scientific Corp. Meta-4 computer. The controller will enable Overly to use a more advanced IBM printer than at present.

World Camera and Sound, Inc. has installed a Burroughs B700 computer system, valued at $100,000, to handle management reports.

The Fred W. Albrecht Grocery Co. has installed an NCR 255 checkout system in the newest of its six Click Family Stores.

The Electronic Systems Division of the Air Force Systems Command has ordered 180 small data processing systems from Honeywell. The estimated value of the fixed price contract over the eight year systems life is $21.3 million.

Decision Data Computer Corp. will install 96-column data entry equipment for General Motors' Truck and Coach Division.

Morse Electro Products Co. has ordered a unit from Mind-Computer Systems, Inc., to perform functions previously done by service bureaus.

Bishop Trust Co. Ltd. has ordered a Univac 90/60 system to handle its accounts as well as medical and insurance accounts.

Computer Communications, Inc. will install a CCI-7000 Message Switching System in the communications center of the U.S. Department of Agriculture. The CCI equipment will become part of the Market News Communication System of the Agricultural Marketing Service.

Oberlin College Conservatory of Music has ordered a Xerox Sigma 9 for use in creating new sounds for musical compositions. The conservatory has been experimenting with techniques for sound synthesis.

Contracts

The Department of Medical Information Science at the University of California in San Francisco has been awarded a contract from the Bureau of Health Services of the Department of Health, Education and Welfare to evaluate computerized medical record systems.

The Polytechnic Institute of New York has received a three-year grant from the Rome Air Development Center to make the current and future computer operations of the Air Force more reliable. The work involves predicting the frequency of software errors as well as developing techniques to prevent them.

The Health Resources Administration of the Department of Health, Education and Welfare has awarded a contract to Aspen Systems Corp. to design, develop, coordinate and manage an operational health resource planning information center.

The Autonetics Group of Rockwell International Corp. has been awarded a $4.7 million contract to produce automatic fingerprint readers for the Federal Bureau of Investigation (FBI). The readers will eventually be integrated into an automated fingerprint identification system.

Strider Systems, Inc. has been awarded a consulting contract by the City of Austin, Texas, to develop and implement a telecommunications-based utility billing and customer information system.

Interdata has won a contract for delivery of Model 7/16 minicomputers to Spectrotherm Corp. to be used in Spectrotherm's Model ST-10 infrared instrument.

Datapoint Corp. has received a contract for 100 Datapoint dispersed data processing systems from the Federal Intermediate Credit Bank of St. Paul, Minn.

Position Announcements

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. . . new and colorful triad furniture accented with greenery resulting in an indoor landscaping affect. This new concept lends itself to a quiet yet bright atmosphere. Added to this we have a company cafeteria providing low cost meals and free parking for your car, bicycle or motorcycle. You'll be working in a pastoral scene but only 20 miles from San Francisco – still one of the most exciting cities in the world.

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Requires minimum of 2 years' large scale 360 or 370 experience or equivelent equipment and COBOL.

SR. SYSTEMS PROGRAMMERS
Requires minimum of 3 years' OS/VS internals and/or IMS internals.

EDP AUDITOR
Requires auditing and EDP experience and excellent communication skills both written and oral. Duties include audit evaluation of existing computer systems, involvement in developing new applications and helping to design computer programs for audit use.

Our salaries and benefits are excellent, and as a promote-from-within company we have advancement opportunities to match your potential.

Please address all inquiries to EDP Employment, (CWI, Lock Box 3395, San Francisco, CA 94119

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The company is located in New York City and offers an excellent salary structure and fringe benefit program. Please submit resume and salary history, which shall be held in confidence, to:

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We are a manufacturing company seeking an individual with 3 years COBOL experience. BOMP, DBOMP, and BAL are considered to be a plus. This is a growth position working to put new applications into our Data Base. Our equipment is an IBM 360/50 with disc and tape.

We offer an attractive starting salary, year-end bonus, profit sharing, and many other liberal fringe benefits. For more complete details send a resume with your qualifications. All replies will be held in strict confidence.

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A major data processing services operation, expanding marketing efforts in the Chicago-Midwest area, is looking for professional data processing-oriented marketing representatives whose expectations include challenge, growth, and opportunities.

Qualifications include a desire and aptitude to work with clients in a marketing environment. Individuals must have 2-4 years marketing expertise. Prefer experience in marketing software systems, data processing services, keypunch sales, and source data entry services. Individuals must be professional, aggressive, and truly interested in growth, client satisfaction, and a marketing career.

Our company offers a professional environment, growth, respect, and is client-oriented. We offer the elite in software systems to a broad range of industries, as well as the finest services available through our information processing center. Home base is Chicago. Limited travel. Excellent fringe benefits. Salary open.

Please send resume, with salary requirements, to CW Box 4255, 797 Washington Street, Newton, Mass. 02160.

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High-Level Computer Industry Marketing Executive

We're looking for someone with the experience, contacts and ability to market our national computer industry trade show. You will work out of our Boston-area offices and travel extensively around the country, seeing (and selling) top-level computer industry executives at manufacturing, marketing, software and consulting companies. You'll be completely responsible for the marketing success of an established, proven product. And you'll have an excellent chance to grow.

To qualify, you must have high-level computer industry marketing experience, an excellent knowledge of the field, and the ability to work long hours traveling around the country. You must also be able to see and deal with the top executives at our client companies of all sizes.

We offer a good salary plus an excellent profit-sharing and bonus program in a small but solidly established and very successful company with a strong growth record. You'll report directly to our top people, and your efforts will be well-rewarded.

To apply, please send your resume, or a detailed letter, to:

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Manage and provide technical direction for IBM 1130 data processing system, heavily used for academic and administrative purposes, and coordinate with PDP-11/40 computer operation in Mathematics Department. M.A. preferred. Experience required. Position to be filled immediately. Salary competitive. Apply to

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2. 1051 Model N1 Console Control
   Features: 3136 CPU attachment, 4410 first punch and 4411 second punch attachments, 4409 first printer attachment Model N1
3. 1051 Model 2 TP Control Unit
   Features: 8030 blower, 9114 data set attachment, 4406 first printer attachment, 8170 keyboard request, 9705 typing tabs
4. 1052 Model 2 Printer Keyboard
   Features: 2704 printer space 10/inch, 9020 bottom exit cable, 8435 line setting 6 lines/inch, 8575 standard print element processing
5. 1052 Model 6 Printer Keyboard
   Features: 2704 printer space 10/inch, 8435 line setting 8 lines/inch, 8571 dual case print element, 1360 Mod. 30, 9020 bottom exit cable
6. 2841 Storage Control Unit
7. 2844 Storage Control channel switch
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Prospective bidders may contact Mr. Herb Allard, Department of Administration and Fiscal Control, Data Services Division, Capitol Building, Cheyenne, Wyoming 82002, telephone (307) 777-7794, for additional information.

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Dated December 9, 1974, at Cheyenne, Wyoming.

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One Memory Maker Reports Loss, Another Doubles Earnings for Year

Memory makers Cambridge Memories, Inc. (CMI) and Advanced Memory Systems, Inc. (AMS) reported varying results for their fiscal years, with CMI earnings more than doubling and AMS disclosing a loss of $2.1 million after some large write-offs.

CMI earnings and revenues were up in both the fourth quarter and year ended August 31. Revenues for the year totaled $23.1 million, almost double the previous year's $12.7 million.

Earnings for the year reached $1 million or 70 cents a share compared with $626,000 or 49 cents a share in the 1973 period, when there was a $63,000 special credit.

During the last quarter, earnings rose to $292,000 or 17 cents a share from $200,000 or 16 cents a share in the year-ago period, while revenues climbed to $6.6 million from $4.4 million in the 1973 period.

The story was different at AMS, where the 1974 loss included write-downs of about $1.8 million, covering both systems and components, in the last quarter. Just over $1.2 million in reserves for obsolete and slow-moving inventory are included in this figure.

Adjustments of about $200,000 were made for spare parts warranties and for returned products and overshipments. A reserve of about $175,000 was established for additional customs duties that may become due, and intangibles amounting to $110,000 were also written off.

Revenues for 1974 rose to $32.5 million from $31.4 million in 1973. The loss for 1973 totaled $196,200.

"While the impact of the write-downs on our 1974 results was very significant," Orion L. Hoch, AMS president, said, "the company continues to improve as an effective operating entity. AMS is now positioned to move forward and become profitable."

Half-Year Net Up 50% at AJ

SUNNYVALE, Calif. – Anderson Jacobson, Inc. reported six-month earnings 50% above those of the same period a year ago.

Half-year earnings jumped to $301,546 or 12 cents a share from $200,057 or 8 cents a share in the same 1973 period.

Revenues rose to $5.8 million from nearly $4 million in the year-ago period. Lease and service revenues grew to $4.8 million from $3.1 million while sales grew to $1 million compared with $895,752 in last year's period.

During the second quarter, earnings rose 38% over those of the same period last year. Earnings reached $149,061 or 6 cents a share compared with $108,132 or 4 cents a share in the 1973 quarter.

Revenues for the quarter rose to $3.1 million from nearly $2.1 million in the year-ago period.

T/S Firms Set Record

Two time-sharing firms, Keydata Corp. and On-Line Systems, Inc., reported record revenues for their respective periods, although On-Line Systems scored record earnings while Keydata's earnings were down from those of the year-ago period.

Keydata's first-quarter earnings, however, marked a change from the preceding fourth quarter's operating loss of $150,000. The Watertown, Mass. firm earned $34,000 or 1 cent a share in the first quarter ended Oct. 31 compared with $271,000 or 10 cents a share in the year-ago period, when there was a $130,000 special credit.

Keydata's first-quarter revenues reached a high of nearly $3.2 million compared with $2.9 million last year.

At On-Line Systems, earnings climbed 33% for the first six months to $881,322 or $1.05 a share compared with $661,891 or 82 cents a share in the year-ago period.

Revenues for the half rose 40% to $6.1 million from $4.4 million in the year-ago period.

During the second quarter, On-Line Systems earnings totaled $454,112 or 54 cents a share compared with $399,139 or 49 cents a share in the year-ago period. Revenues rose to nearly $3.2 million from $2.5 million in the same 1974 period.

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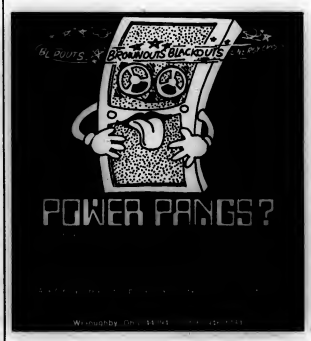


Earnings Reports

CINCINNATI MILACRON
Four Months Ended Oct. 5

	1974	1673
Shr Ernd	$.70	$.65
Revenue	130,089,576	107,216,350
Earnings	2,590,626	2,407,753
10 Mo Shr	•2.45	1.81
Revenue	335,663,593	275,646,669
Earnings	•9,031,351	6,717,067

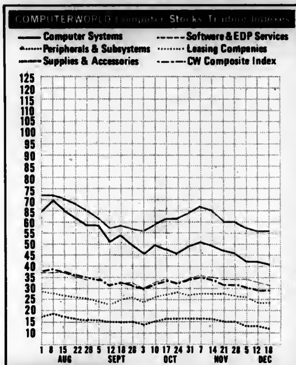
SYSTEMS ENGINEERING LABS
Three Months Ended Sept. 27

	1974	1973
Revenue	$4,525,215	$3,099,745
Loss	109,619	778,246

WYLY
Three Months Ended Sept. 30

	1674 (000)	1673 (000).
Revenue	a$24,577	$24,464
Disc Op	.....	(1,219)
Spec Cred	b12,941	.....
Loss	1,560	7,196
9 Mo Rev	a74,993	76,314
Disc Op	.....	(1,219)
Spec Cred	b12,941	.....
Loss	650	6,425

a-Includes unconsolidated insurance underwriting revenues. b-Proceeds from contract termination.



GREYHOUND COMPUTER
Three Months Ended Sept. 30

	1674	1973
Shr Ernd	$.06	$.16
Revenue	13,236,000	12,063,000
Earnings	•334,000	668,000
9 Mo Shr	.25	.45
Revenue	39,705,000	33,408,000
Earnings	•1,060,000	1,946,000

a-Includes $118,000 from sale of investment.

STORAGE TECHNOLOGY
Three Months Ended Sept. 27

	1974	1673
Shr Ernd	$.38	$.46
Revenue	19,898,000	15,385,000
Tax Cred	.....	435,000
Earnings	1,367,000	1,646,000
9 Mo Shr	1.04	1.36
Revenue	54,227,000	38,425,000
Tax Cred	.....	1,600,000
Earnings	3,731,000	4,766,000

WABASH MAGNETICS
Three Months Ended Sept. 30

	1674	1673
Shr Ernd	$.11	$.16
Revenue	7,574,692	6,560,891
Earnings	180,666	313,220
9 Mo Shr	.61	.64
Revenue	25,742,326	22,475,347
Earnings	1,051,323	1,131,128

DATA CARD
Three Months Ended Sept. 28

	1974	1973
Shr Ernd	$.12	$.12
Revenue	2,075,000	1,557,000
Earnings	161,000	176,000
6 Mo Shr	.27	.25
Revenue	4,039,000	2,966,000
Earnings	401,000	367,000

INFORMATION MAGNETICS
Nine Months Ended Sept. 28

	1974	1973
Shr Ernd	$.32	$.39
Revenue	17,264,099	13,244,328
Tax Cred	440,631	460,000
Earnings	407,660	499,702

FABRI-TEK
Three Months Ended Sept. 27

	1974	1973
Shr Ernd	$.03	$.17
Revenue	6,454,000	8,807,000
Tax Cred	.....	266,000
Earnings	102,000	556,000
6 Mo Shr	.12	.31
Revenue	18,990,000	16,291,000
Tax Cred	.....	511,000
Earnings	438,000	1,010,000

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Computerworld Stock Trading Summary

All statistics compiled, computed and formatted by TRADE★QUOTES, INC. Cambridge, Mass. 02139

EXCH		1974 RANGE (1)	CLOSE DEC 19 1974	WEEK NET CHNGE	WEEK PCT CHNGE
	CONRUTEA SYSTEMS				
N	BURROUGHS CORR	63-217	78 1/4	+1 5/8	+2.1
O	COMRUTER AUTOMATION	2- 14	2 3/8	- 1/8	-5.0
N	CONTAOL OATA CORP	10- 38	10 1/8	- 1/8	-1.2
N	OATA GENERAL CORP	12- 38	12 3/8	-1 1/2	-10.0
O	OATAROINT CORR	5- 15	8	+ 1/2	+0.0
O	OIGITAL COMP CONTROL	1- 5	7/8	- 1/8	-12.5
N	OIGITAL EQUIPMENT	51-121	52 3/4	-3 1/4	-5.8
N	ELECTROMIC ASSOC.	1- 3	1	- 1/4	-20.0
A	ELECTRONIC ENGINEER.	4- 11	5 1/4	+ 1/2	+10.5
N	FOKBORO	19- 48	21 1/4	-3 1/2	-14.1
O	GENERAL AUTONATION	7- 40	8 1/4	+ 1/2	+8.4
O	GRI COMRUTER CORR	1- 2	1/N	0	0.0
N	NEWLETT-PACKARO CO	54- 90	58 1/8	- 1/8	-0.2
N	HONEYWELL INC	1R- 88	19 1/4	- 1/2	-2.5
N	IRM	152-251	169	- 1/2	-0.2
O	INTENOATA INC	8- 22	1A 3/8	+1 1/4	+9.5
O	MICROOATA CONR	1- 5	1 5/8	+ 1/8	+8.3
N	NCR	14- 40	14 1/2	+ 1/8	+0.8
N	RAYTNEON CO	21- 39	25 3/4	+1 1/A	+5.1
N	SINGER CO	10- 40	10 7/8	- 1/8	-1.1
N	SRENRY RAMO	24- 44	28	-1	-3.7
A	SYSTENS ENG. LABS	1- 3	7/8	- 1/8	-12.5
N	TFXAS INSTRUNENTS	80-115	86 3/4	+ 3/8	+0.5
O	ULTIMACC SYSTENS INC	1- 2	5/8	0	0.0
N	VAMIAN @SSOCIATES	8- 13	8	- 1/8	-2.0
N	WANG LABS.	7- 20	6 5/8	- 5/8	-8.8
N	XENOX CORP	51-127	52 1/2	-1 3/4	-3.2
	LEASING CONRANIES				
O	BRESNAMAN CONP.	2- 2	2 1/8	0	0.0
O	CONDISCO INC	1- 7	3/4	- 1/A	-25.6
A	COMMERCE GROUP CORP	2- 6	2 3/8	- 1/8	-5.6
O	COMPUTER EXCHANGE	1- 1	1/R	0	0.0
A	COMRUTER INVSTRS GRP	0- 4	1/2	+ 1/4	+79.0
O	COMP. INSTALLATIONS	1- 1	1/4	0	0.0
N	DATRONIC RENTAL	1- 1	1/2	- 1/A	-33.3
A	OCL INC	0- 1	1/4	0	0.0
N	OPF INC	2- 5	3	+ 3/8	+14.2
O	EDP RESOURCES	2- 3	3 1/A	0	0.0
A	GRANITE MGT	1- 3	3/4	-	-7.0
A	GREYHOUND COMPUTEN	2- 6	1 5/8	- 1/A	-13.3
A	ITEL	3- 6	2 7/8	- 1/4	-8.0
N	LEASCO CORP	5- 12	5	- 7/8	-14.8
O	LEASRAC CORP	1- 2	1/2	0	0.0
O	LECTNO MGT INC	1- 1	1/R	0	0.0
O	NRG INC	1- 5	1 1/4	- 1/8	-9.0
A	PIONEER TEX CORP	2- 10	2 1/4	+ 1/4	+12.5
A	NOCKWOOD COMPUTEN	0- 1	1/4	0	0.0
N	U.S. LEASING	5- 24	8 3/A	+1 1/8	+13.0

EXCH		1974 RANGE (1)	CLOSE DEC 19 1974	WEEK NET CHNGE	WEEK RCT. CHNGE
	SOFTWARE & EOP SERVICES				
O	ADVANCED CONR TECN	1- 2	5/8	0	0.0
A	APPLIED DATA RES.	1- 3	1 1/8	+ 1/8	+12.5
O	APRLIED LOGIC	1- 1	1/8	0	0.0
N	AUTONATIC DATA PROC	?1- 57	27 3/4	-1 3/4	-5.9
O	RNANOON APRLIED SYST	1- 1	1/4	0	0.0
O	CENTRAL DATA SYSTEMS	4- 8	3	0	0.0
O	CONRUTER DIMENSIONS	1- 3	1 5/8	0	0.0
O	COMPUTER NORIZONS	1- 5	1/2	0	0.0
O	CONPUTER NETWORK	1- 2	1/2	0	0.0
N	COMPUTER SCIENCES	2- 4	2 1/8	+ 1/8	+8.2
O	CONRUTER TASK GROUP	1- 1	3/R	0	0.0
O	COMPUTER TECHNOLOGY	1- 1	1/2	0	0.0
O	COMPUTER USAGE	2- 4	2 1/R	+ 1/A	+13.3
O	CONRESS	1- 1	1/8	- 1/8	-50.0
O	COMSHARE	2- 4	2 7/8	- 1/8	-4.1
N	CORDURA CORR	1- 4	1 1/8	+ 1/8	+12.5
O	DATATAB	1- 3	1	+ 1/8	+14.2
A	ELECT CONR RHOG	1- 1	1/4	0	0.0
N	ELECTRONIC DATA SYS.	11- 25	14	+1 3/8	+10.8
O	INFONATIONAL INC	1- 2	3/8	0	0.0
O	I.O.A. DATA CORR	1- 1	1/4	0	0.0
O	IPS COMPUTER MARKET.	1- 1	1/2	- 1/8	-20.0
O	KEANE ASSOCIATES	2- 4	1 3/4	0	0.0
O	KEYDATA CORP	1- 8	1 7/8	- 1/8	-8.2
O	LOGICON	2- 5	2 7/8	0	0.0
A	NANAGEKENT DATA	1- 2	1	- 1/8	-11.1
O	NATIONAL CSS INC	5- 37	7 1/4	+1	+18.0
O	NATIONAL COMPUTER CO	1- 1	1/4	0	0.0
A	ON LINE SYSTENS INC	17- 30	9 1/8	- 3/8	-3.9
N	PLANNING RESEARCN	2- 3	1 3/4	- 3/8	-17.8
O	RNOGRAMMING & STS	1- 1	5/8	0	0.0
O	RAPIDATA INC	1- 5	1 1/2	- 1/8	-7.8
O	SCIENTIFIC CONRUTENS	1- 1	7/8	0	0.0
O	SIMPLICITY CONRUTEN	1- 1	1/2	0	0.0
O	TCC INC	1- 1	1/8	0	0.0
O	TYMSNARE INC	6- 12	6	0	0.0
O	UNITED DATA CENTER	2- 4	2 5/8	+ 1/8	+5.0
A	URS SYSTEMS	2- 4	1 1/2	- 1/2	-25.0
N	WTLT CORP	2- 5	1 1/2	- 1/4	-14.2
	PENIPHERALS & SUBSYSTENS				
N	ADDNESSOGRARH-MULT	3- 11	3 1/4	+ 1/4	+8.3
O	ADVANCED MEMORY SYS	1- 7	1 1/4	0	0.0
N	AMPEX CORP	2- 5	2 1/8	- 3/8	-15.0
O	ANDERSON JACOBSON	1- A	1 1/4	- 1/4	-16.6
O	GFENIVE MEDICAL ELEC	1- 7	1	- 1/2	-33.3
A	BOLT.BERANEK & NEW	5- 9	4 7/8	+ 1/8	+2.6
N	BUNKER-RAMO	3- 8	3 1/4	- 1/4	-7.1
A	CALCOMP	4- 11	3 7/8	+ 1/4	+6.0
O	CAMBRIDGE MEMORIES	3- 16	2 7/8	+ 1/4	+9.5
O	CENTRONICS DATA CONR	7- 23	7 3/8	- 3/8	-4.8
O	CODEX CORP	8- 18	14 1/2	0	0.8
O	COGNITRONICS	1- 2	3/8	0	0.0

EXCH		1974 RANGE (1)	CLOSE DEC 19 1974	WEEK NET CHNGE	WEEK PCT CHNGE
O	COMPUTER CONNUN.	1- 2	5/8	+ 1/8	+25.0
A	CONRUTER EQUIRNENT	1- 2	1	0	0.0
O	CONPUTER NACHINENY	1- 5	1 1/8	- 1/8	-10.0
O	COMRUTER TRANSCEIVER	1- 2	3/4	+ 1/8	+20.0
N	CONRAC CORP	10- 22	11 3/4	+ 1/4	+2.1
O	DATA ACCESS SYSTEMS	2- 3	2 1/2	0	0.0
O	DATA 108	4- 13	4 1/2	+ 1/4	+5.8
A	DATA PRODUCTS CORP	2- 4	2	- 1/8	-5.8
O	DATA RECOONITION	1- 1	1/A	0	0.0
O	DATA TECHNOLOGY	2- 4	1 5/8	- 1/8	-7.1
O	DECISION DATA CONPUT	3- 13	3 1/4	+ 3/8	+13.0
O	DELTA DATA SYSTENS	1- 2	1/2	+ 1/8	+33.3
O	DI/AN CONTROLS	1- 2	1/4	- 1/4	-50.0
N	ELECTRONIC M & M	1- 4	1 1/8	+ 1/8	+12.5
O	FABRI-TEK	1- 3	1/2	0	0.0
O	GENENAL COMPUTER SYS	1- 4	3/4	- 1/4	-25.0
N	GENERAL ELECTRIC	30- 85	33 3/8	+ 3/A	+2.2
N	MAZELTIME CORP	2- 7	2 3/8	+ 1/4	+11.7
O	INFOREX INC	1- 5	1 3/8	- 1/8	-8.3
O	INFOANATION DISPLAYS	1- 1	1/8	0	0.0
O	INFOANATION INTL INC	8- 14	7 3/4	+1 1/4	+19.2
A	LUNDY ELECTRONICS	3- 3	2 7/8	0	0.0
O	MANAGENENT ASSIST	1- 1	1/8	0	0.0
N	MEMOREX	2- 5	1 5/8	- 1/8	-7.1
A	MILGO ELECTRONICS	8- 10	8 5/8	0	0.0
N	MOMAWK DATA SCI	1- 4	1 1/8	- 1/A	-10.1
O	DOEC CONRUTER SYST.	1- 3	7/8	+ 1/8	+18.0
O	ORTICAL SCANNING	3- 8	2	0	0.0
O	PERTEC CORR	1- 8	1 1/2	- 1/8	-7.8
A	POTTEN INSTRUNENT	1- 5	1 3/4	0	0.0
O	PRECISION INST.	1- 3	1/2	0	0.0
O	QUANTOR CORP	2- 8	2 1/4	- 1/A	-10.0
O	RECOGNITION EQUIP	2- 5	1 3/4	- 1/8	-6.6
N	SANDERS ASSOCIATES	2- 8	2 3/8	+ 3/8	+10.7
O	SCAN DATA	1- 2	1/2	0	0.0
O	STORAGE TECHNOLOGY	8- 15	8 1/4	- 1/4	-3.0
U	SYCOR INC	4- 13	4 1/2	0	0.0
O	TALLY CONR.	1- 4	1	0	0.0
O	TEC INC	1- 7	1 1/4	- 1/4	-16.8
N	TEKTRONIK INC	19- 40	18 5/8	-1 3/8	-6.8
N	TELEK	3- 4	2 5/8	- 1/8	-4.5
O	WANGCO INC	3- 13	3 3/8	- 1/8	-3.5
O	WILTEK INC	1- 8	1	0	0.0
	SUPPLIES & ACCESSORIES				
O	BALTIMORE BUS FONMS	4- 6	4 1/4	0	0.0
A	BANNY WRIGHT	A- 7	4	- 1/4	-5.8
O	CYBERNATICS INC	1- 2	1/2	0	0.0
A	DATA DOCUNENTS	23- 54	28 1/4	- 3/A	-2.8
O	DUPLEX RRODUCTS INC	8- 17	13 3/4	+ 5/8	+4.7
N	ENNIS BUS. FORMS	4- 7	4 7/8	+ 1/4	+5.4
O	GRAHAN MAGNETICS	6- 11	8 3/4	- 1/4	-4.1
O	GRARNIC CONTNOLS	6- 11	8 3/4	+1 1/4	+16.6
N	3M COMRANY	46- 79	50 1/4	- 3/4	-1.A
O	MOORE CONR LTD	33- 57	42	+1 1/2	+3.7
N	NASHUA CORP	17- 45	16 7/8	-1 7/8	-10.0
O	REYNOLDS & REYNOLD	6- 35	7 1/2	0	0.0
O	STANDANO REGISTER	10- 18	10 3/4	- 1/4	-2.2
O	TAB RRODUCTS CO	A- 11	4	0	0.0
N	UARCO	13- 23	17 1/2	- 3/4	-4.1
A	WABASH MAGNETICS	3- 7	2 5/8	- 3/8	-12.5
N	WALLACE BUS FORMS	14- 24	14	- 7/8	-5.8

EXCH: N=NEW YORK; A=AMERICAN; R=PHIL-BALT-WASH
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Top Line Features. Bottom Line Price.

1 PLUG-IN UPGRADES

Need more memory? Plug it in. Each of the eight Basic Storage Modules (BSM's) of the CIG system can accept up to 256K bytes of plug-in semi-conductor memory. So when you need more memory, you'll get it. Fast.

2 DOUBLE CAPACITY

IBM: One meg
CIG: Two meg's

The CIG/145 has dual gates each of which contains up to a full megabyte of main memory. Up to 2,048K bytes in one compact unit. CIG's double capacity. Twice the memory IBM can give you.

3 MODEL CHANGES

Every CIG/145 memory system includes the proper model change required to upgrade your 145 CPU to its new storage capacity. So you save twice. Once on the memory system. Once on the model change. Both from CIG.

4 REALLOCATION

The CIG/145 will reallocate any segment of main memory in 128K increments. So if you do have a problem, you move it where it hurts you least. In fact, your CIG/145 system will even cover-up for failing IBM memory. All under operator control.

5 INVISIBLE MEMORY

Throw a switch and we'll disappear. Really! CIG's on-line/off-line switch will make your 145 think its CIG memory was never there. So if IBM has a problem, they can't point at us, 'cause they can't find us. We're invisible!

6 ECCL

CIG's Error Checking and Correction Logic. It keeps your system up even if the chips are down. In fact, the CIG/145 can continue to operate with an entire 32K bit memory card out. Because each card contributes only one bit per word. And our ECCL automatically corrects all single bit errors.

7 FOUR LEVEL DIAGNOSTICS

The CIG/145 allows four levels of integrated diagnostic support: 1) Off-line operation from the integral test panel. 2) Execution of CIG stand alone diagnostics. 3) IBM and CIG microdiagnostics executed from the 3145's microinstruction processor. 4) IBM on-line diagnostics such as OLTEP (Online Test Executive Program) and ASCP (Automatic System Checkout Program).

IBM offers only the last two levels of diagnostic support, both of which require use of the central processor to execute.

Which means your operations stop when IBM's diagnostics start.

8 SERVICE

We're memory specialists. So if your CIG memory system ever does require service, you get a CIG memory expert. Not a generalist like IBM might send. Your CIG memory spares are on-site, too. Not at some remote depot. That's one of the ways we keep 650 CIG memory customers happy.

9 PACKAGE LEASING

CIG not only gives you 145 memory, we can lease you the mainframe and all your disc and tape peripherals to boot. That way you get everything from one source. All the equipment. And all the savings.

10 CIG/145. ITS BEST FEATURE IS US.

As we said before, you don't keep 650 memory customers happy by being charming. You keep them happy with innovative products backed by solid performance and service.

CIG is the world's largest independent memory supplier with sales, service, and systems engineering support available throughout the United States, Canada and Europe.

In addition to our 360/370 and Univac memory systems, other CIG products and services include 360/370 package leasing, plug-compatible block multiplexer and selector channels, and IBM plug-compatible disc and tape I/O subsystems. What we've done for other people, we know we can do for you. Check us out. And call us in.

CIG

CIG COMPUTER PRODUCTS, INC.

A Subsidiary of Computer Investors Group, Inc.

1351 Washington Blvd., Stamford, Conn. 06902

Dear CIG,

☐ I'd like to check your prices. Have your rep call me at_____

☐ Send a copy of "Add on Memory for the 370/145."

☐ Send info on other CIG Memory for the 360/_____, 370/_____

Name_____ Title_____

Company_____

Street_____

City_____ State_____ Zip_____

CW-12-25

When you're the Top Cat in Add-On Memory, you never stop improving the breed.